BOTANICAL MUSEUM LEAFLETS

HARVARD UNIVERSITY

PRINTED AND PUBLISHED AT THE
BOTANICAL MUSEUM
CAMBRIDGE, MASSACHUSETTS

BOTANICAL MUSEUM LEAFLETS

HARVARD UNIVERSITY

VOLUME III

BOTANICAL MUSEUM
CAMBRIDGE, MASSACHUSETTS
1934-1935

TABLE OF CONTENTS

NUMBER I (September 19, 1934)

PAGE

Notes on Mexican Epidendrums based largely on the Erik M. Östlund Collection
By OAKES AMES, F. TRACY HUBBARD AND CHARLES SCHWEINFURTH 1

NUMBER II (October 10, 1934)

A Contribution to our Knowledge of the Orchids of Spanish Honduras. Part II.
By OAKES AMES 17

NUMBER III (December 27, 1934)

Critical Notes on Costa Rican Orchids
By OAKES AMES, F. TRACY HUBBARD AND CHARLES SCHWEINFURTH 37

Nomenclatorial Notes
By CHARLES SCHWEINFURTH 43

NUMBER IV (January 15, 1935)

Studies in Stelis. III.
By OAKES AMES 45

NUMBER V (February 5, 1935)

Studies in Epidendrum
By OAKES AMES, F. TRACY HUBBARD AND CHARLES SCHWEINFURTH 61

NUMBER VI (February 19, 1935)

PAGE

Additions to the Orchid Flora of British Guiana
By CHARLES SCHWEINFURTH 77

Corrections 92

NUMBER VII (March 6, 1935)

A fourth polymorphic Alliance in Epidendrum
By OAKES AMES, F. TRACY HUBBARD AND CHARLES SCHWEINFURTH 93

Nomenclatorial Notes. II.
By CHARLES SCHWEINFURTH 111

NUMBER VIII (May 23, 1935)

Nomenclatorial Studies in Malaxis and Spiranthes
By OAKES AMES AND CHARLES SCHWEINFURTH 113

Studies in Stelis. IV.
By OAKES AMES 134

Nomenclatorial Notes. III.
By CHARLES SCHWEINFURTH 136

NUMBER IX (June 29, 1935)

Permian Elements in the Fossil Flora of the Appalachian Province. I. Taeniopteris.
By WILLIAM C. DARRAH 137

NUMBER X (October 31, 1935)

Studies in Stelis. V.
By OAKES AMES 149

INDEX TO ILLUSTRATIONS

PAGE

Habenaria alata *Hook.* 20
Habenaria clypeata *Lindl.* 23
Habenaria crassicornis *Lindl.* 23
Habenaria eustachya *Reichb.f.* 23
Habenaria hondurensis *Ames* 29
Habenaria novemfida *Lindl.* 23
Habenaria odontopetala *Reichb.f.* 23
Habenaria Pringlei *B. L. Robins.* 33
Habenaria repens *Nutt.* 23
Habenaria setifera *Lindl.* 23
Stelis ciliaris *Lindl.* 166, 167, 169
Stelis crescentiicola *Schltr.* 172
Stelis crystallina *Ames* 47
Stelis glossula *Reichb.f.* 153
Stelis inaequalis *Ames* 157
Stelis latipetala *Ames* 51
Stelis ovatilabia *Schltr.* 161, 163, 165
Stelis pardipes *Reichb.f.* 135
Stelis Storkii *Ames* 57

INDEX

TO GENERA AND SPECIES

ACHROANTHES Raf.
maianthemifolia Greene . 122
montana Greene 120
porphyrea Woot. & Standl. 116
purpurea Greene . . . 116
unifolia Raf. 125

ALETHOPTERIS *Sternb.*
grandini *Zeill.* 146
macrophylla *Newb.* . . 142
maxima *Andr.* 142
missouriensis *D.W.* . . 142

ARNOTTIA *A.Rich.* . . 18

ASTEROPHYLLITES *Brongn.*
equisetiformis *Schloth.* . 146

AULIZEUM Lindl. ex Stein
variegatum Stein 67

BARBOSELLA Schltr.
Bradeorum Schltr. . . . 39
prorepens Schltr. . . . 40
Reichenbachiana Schltr. . 39

BARLAEA Reichb.f. . . 18

BARTHOLINA *R.Br.* . . 18

BICORNELLA *Lindl.* . . 18

BLEPHARIGLOTTIS Raf. 18

BLETIA *Ruiz & Pav.*
Lankesteri (*A. & S.*) *A., H. & S.* 41

BONATEA Willd. . . . 18

CALLIPTERIDIUM *Weiss*
gigas *G'E.* 146

COELOGLOSSUM Hartm. 18

COSTARICAEA Schltr.
Amparoana Schltr. . . . 40

CYNORCHIS *Thou.* . . . 18

DEROEMERA *Reichb.f.* . 18

DICRYPTA Lindl.
Baueri Lindl. 136

DIDOTHION Raf.
clavatum Raf. 75

DIENIA Lindl.
calycina Lindl. . 114, 115
majanthemifolia Reichb.f. 117

DIPLOMERIS *D.Don.* . 18

DIPLOTMEMA *Stur*
ribeyroni *Zeill.* 146, 147, 148

DIPTERYX *Schreb.*
panamensis (*Pittier*) *Record & Mell* 92

EICHHORNIA *Kunth*
crassipes (*Mart.*) *Solms* . 35

ENCYCLIA Hook.
acicularis Schltr. . . . 63
Brenesii Schltr. . . 99, 106
granitica Schltr. . . 98, 101

gravida Schltr. . . 97, 104
guttata Schltr. 72
Hunteriana Schltr. . 98, 104
Mooreana Schltr. . . . 97
oncidioides Schltr. . 97, 101
Powellii Schltr. . . 98, 103
Powellii Schltr. apud Ames 104
ramonensis Schltr. . 97, 103
tessallata Schltr. . . . 68
Tonduziana Schltr. 99, 106
Tuerckheimii Schltr. . . 75

EPIDENDRUM *L. ampl. Neck.*
aciculare Batem. apud Lindl. 63, 64
adenocarpon *La Llave & Lex.*
var. Rosei *A., H. & S.* 61
affine Focke . . . 96, 101
alanjense Ames . . 98, 104
amandum Ames . . 98, 105
ambiguum Lindl. misdet. Rolfe 107
anisatum Lindl. 6
arbuscula *Lindl.*
var. radioferens *A., H. & S.* 62
atropurpureum *Willd.*
var. laciniatum *A., H & S.* 63
baculibulbum Schltr. . . 67
Boothianum *Lindl.* . . 11
bractescens *Lindl.* . . . 63
carinatum Lindl. . . . 70
centradenia *Reichb.f.* . 70
clavatum Lindl. 75
var. *purpurascens* Cogn. 75
cochleatum *L.* . . . 8, 9
conopseum *R.Br.* 1
coriaceum Focke 66
coriaceum Parker apud Hook. 66, 67
coriaceum *Poir.* 67
costatum *A.Rich. & Gal.* 64
crassilabium *Poepp. & Endl.* 66
curvicolumna *A., H. & S.* 67
cyanocolumna *A., H. & S.* 2
Deamii *Schltr.* 68
dentilobum *A., H. & S.* 69
difforme *Jacq.* 68
esculentum Hort. Kew. . 63
eustirum *A., H. & S.* . 70
falcatum Lindl. 74
var. *Zeledoniae* Schltr. 74
favoris *Reichb.f.* . . . 11
Ghiesbreghtianum *A.Rich. & Gal.* 4
Ghisbreghtianum Schltr. . 4
giganteum Hort. Belg. apud J.E.Planch. . . 96, 104
gladiatum Lindl. 6
glaucovirens *A., H. & S.* 70
glaucum Lindl. 70
glaucum *Sw.* 70
glumibracteum Reichb.f. 75
graniticum Lindl. 93, 95, 101
gravidum Lindl. 93, 95, 104, 106
guatemalense Klotzsch 93, 95, 101
Guillemianum Hort. apud J.E.Planch. . . 96, 104
guttatum A.Rich. & Gal. 72
hastatum *Lindl.* . . . 4, 6
incomptoides *A., H. & S.* 71
incomptum *Reichb.f.* . . 72
Juergensii *Reichb.f* . . . 6
lactiflorum A.Rich. & Gal. 74
lamprocaulon Reichb.f. . 64
lancifolium *Pav. apud Lindl.* 8

Langlassei Schltr. . . 8, 9
ledifolium *A.Rich. & Gal.* 72
ligulatum *La Llave & Lex.* 4
linearifolium Hook. . . 63
luteoroseum *A.Rich. & Gal.* 16
maculosum *A., H. & S.* 72
magnispatha *A., H. & S.* 10
Mooreanum Rolfe 93, 97, 99, 106
myodes Reichb.f. . . . 75
obliquifolium *A., H. & S.* 73
Oestlundii *A., H. & S.* . 11
oncidioides *Lindl.* 93, 94, 100, 101, 110
var. *graniticum* Lindl. 96, 101
var. gravidum (*Lindl.*) *A., H. & S.* 100, 101, 104
var. Itabirae *W. Zimmerm.* 110
var. Mooreanum (*Rolfe*) *A., H. & S.* 100,101,106,109
var. perplexum *A., H. & S.* 101, 108
var. profusum (*Rolfe*) *A., H. & S.* . . 101, 107
var. ramonense (*Reichb.f.*) *A., H. & S.* 100, 101, 103, 105, 106, 109
pachycephalum Veitch . 67
pachysepalum Klotzsch . 66
pamplonense Reichb.f. . 66
Parkinsonianum *Hook.* . 74
var. falcatum (*Lindl.*) *A., H. & S.* 74
Peperomia *Reichb.f.* . . 74
peraltense Ames 98, 105, 106
polyanthum *Lindl.*
var. myodes (*Reichb.f.*) *A., H. & S.* 75
profusum Rolfe 93, 97, 98, 107, 110
propinquum *A.Rich. & Gal.* 72
pudicum *Ames* 68
purpurascens *Focke* . . 75
ramonense Reichb.f. 96, 98, 103
Schlechterianum *Ames* . . 1
selligerum *Batem. apud Lindl.* 13
sessile Sw. 136
spectabile Focke . . 96, 101
subulatifolium *A.Rich. & Gal.* 13
tenuissimum *A., H. & S.* 15
tessellatum Batem. apud Lindl. 68
tessellatum *Roxb.* . . . 68
tripunctatum *Lindl.* . . . 3
Tuerckheimii (*Schltr.*) *A., H. & S.* 75
variegatum Hook. . . 66, 67
var. *coriaceum* Lindl. . 66
var. *crassilabium* Lindl. 66
var. *leopardinum* Lindl. 66
var. *lineatum* Reichb.f. 66
var. *virens* Lindl. . . 66
venosum *Lindl.* 6
verrucosum *Sw.* 1
virgatum *Lindl.* 76
virgatum *Vell.* 76

EPIPACTIS [Haller] Boehm.
erosa A. & S. 37

EPITHECIA Knowles & Westc.
glauca Knowles & Westc. 70

GLOSSULA Lindl. . . . 18

GOMPHICHIS *Lindl.*
costaricensis (*Schltr.*) *A., H. & S.* 37

GOODYERA *R.Br.*
erosa (*A. & S.*) *A., H. & S.* 37

GYMNADENIA R.Br. . 18

GYMNADENIOPSIS Rydb. 18

GYROSTACHYS Pers.
cinnabarina O.Ktze. . . 127
madrensis O.Ktze. . . . 128
montana O.Ktze. . . . 127
polyantha O.Ktze. . . . 132
Schaffneri O.Ktze. . . . 111
sulfurea O.Ktze. . . . 129

HABENARIA *Willd.* . . 18
adenantha A.Rich. & Gal. 25
alata *Hook.* 19, 20
clypeata *Lindl.* . . . 19, 21
crassicornis *Lindl.* . . 19, 25
diffusa A.Rich. & Gal. . 31
Endresiana *Schltr.* . . . 36
eustachya *Reichb.f.* 19, 26
hondurensis *Ames* . 19, 26
Jimenezii *Schltr.* . . . 31
lactiflora A.Rich. & Gal. 21, 25
macroceratitis *Willd.* . 31
novemfida *Lindl.* 19, 27, 31
odontopetala *Reichb.f.* 19, 31
platantheroides Schltr. . 20
Pringlei *B.L.Robins.* 19, 31
quinquifila *Schltr.* . . . 25
repens *Nutt.* . . . 19, 35
Selerorum *Schltr.* . . . 31
setifera *Lindl.* . . 19, 35
spathacea A.Rich. & Gal. 36
spithamaea *Schltr.* . . . 25
stricta A.Rich. & Gal. . 20
tetranema *Schltr.* . . . 27

Habenarieae 17

HEMIPILIA *Lindl.* . . . 18

HERMINIUM *L.* 18

HETEROTAXIS Lindl.
crassifolia Lindl. . . . 136

HEXISEA *Lindl.*
Amparoana (*Schltr.*) *A., H. & S.* 40

HOLOTHRIX *L.C.Rich.* . 18

HUTTONAEA *Harv.* . . 18

IBIDIUM Salisb.
lucayanum Britton 132, 133

KEFERSTEINIA *Reichb.f.*
lactea *Reichb.f. apud B. D. Jacks.* 41

LEPANTHES *Sw.*
fimbriata Ames 38
Lindleyana *Oerst. & Reichb.f.*
var. angustifolia *A., H. & S.* 37
var. major *A., H. & S.* 38
pubilabia Schltr. . . . 38

LESCUROPTERIS *Schimp.*
moorii *Lesqx.* 146

LEUCORCHIS E. Mey. . 18

LIMODORUM *L.*
abortivum *Sw.* 41
Lankesteri A. & S. . . . 41

MALAXIS *Sw.*
aurea *Ames* 113
brachyrrhyncha Ames . . 113
brachyrrhynchos (*Reichb.f.*) *Ames* 113
calycina (*Lindl.*) *O.Ktze.* 114
cochleariaefolia A.Rich. & Gal. 121, 122
densiflora A.Rich. & Gal. apud Ridl. 120
Ehrenbergii (*Reichb.f.*) *O. Ktze.* 115

fastigiata (*Reichb.f.*) *O.Ktze.* 116, 125
Grisebachiana Fawc. & Rendle 126
hastilabia (*Reichb.f.*) *O.Ktze.* 118
ichthiorhyncha A.Rich. & Gal. 121, 122
Javesiae (*Reichb.f.*) *Ames* 119
Lankesteri Ames 114
lepidota (*Finet*) *Ames* . . 120
linguella Ames 117
longisepala O.Ktze. . . 117
macrantha Ames 120
macrostachya (*La Llave & Lex.*) *O.Ktze.* 120
maianthemifolia A. Rich. & Gal. 117, 118
majanthemifolia *Schlecht. & Cham.* 121
mexicana Ames 119
montana O.Ktze. . . . 120
monticola Ames 114
ophioglossoides Muhl. ex Willd. . . . 117, 125
pandurata (*Schltr.*) *Ames* 123
Parthonii *Morr.* . . . 123
var. denticulata (*Reichb.f.*) *A., H. & S.* . . . 40
porphyrea O.Ktze. . . . 116
purpurea O.Ktze. . . . 116
Reichei (*Schltr.*) *A. & S.* 124
Soulei L.Will. 120
thlaspiformis A.Rich. & Gal. 126
Tuerckheimii Ames . . . 123
uncinata A. & S. 118, 119
unifolia *Michx.* 125
Wercklei Ames 40

MARIOPTERIS *Zeill.*
cordato-ovata Lesqx. 146, 147, 148
occidentalis *D.W.* . . . 147

MAXILLARIA *Ruiz & Pav.*
acutifolia *Lindl.* 41
acutifolia Schltr. . . . 41
angustissima *A., H. & S.* 41
crassifolia *Reichb.f.* . . 136
flava *A., H. & S.* . . . 41
gatunensis Schltr. . . . 136
ramonensis *Schltr.* . 41, 42
sessilis Fawc. & Rendle 136
sessilis *Lindl.* 136

MESADENUS Schltr.
Galeottianus Schltr. . . 132
lucayanus Schltr. . . . 132
minutiflorus Schltr. . . 130
polyanthus Schltr. . . . 132

MICROSTYLIS (Nutt.) Lindl.
brachyrrhynchos Reichb.f. 114
Brenesii Schltr. 124
calycina Ridl. 114
cochleariaefolia Reichb.f. 122
elegantula Schltr. 122, 123
Ehrenbergii Reichb.f. . 115
fastigiata Reichb.f. 117, 118
gracilis Ridl. . . 114, 115
Grisebachiana Fawc. & Rendle 126
guatemalensis Schltr. . . 113
hastilabia Reichb.f. 118, 119
histionantha Link, Klotzsch & Otto 124
ichthiorrhyncha Reichb.f. 122
Javesiae Reichb.f. . . . 119
lepidota Finet 120
linguella Reichb.f. 117, 118
longisepala Ridl. 117, 118
macrostachya Lindl. 120, 121
majanthemifolia Reichb.f. 122

microtoides Schltr. 114, 115
minutiflora Schltr. . . . 116
montana Engelm. apud Rothrock 120, 121
monticola Schltr. 114, 115
ophioglossoides Nutt. apud A. Eaton 125
β. *mexicana* Lindl. 117, 125
pandurata Schltr. . . . 123
Parthoni Reichb.f. . . . 124
var. *denticulata* Reichb.f. 40
porphyrea Ridl. 116
purpurea S. Wats. . . . 115
Reichei Schltr. 125
Türckheimii Schltr. . . 123
unifolia BSP. 126
Wercklei Schltr. 40

MONTOLIVAEA Reichb.f. 18

NEOTTIA *L.*
cinnabarina La Llave & Lex. 127
michuacana La Llave & Lex. 128, 129, 130
sulphurea La Llave & Lex. 128, 129

NEUROPTERIS *Brongn.*
sp. 146
cordata *Brongn.* 146
grangeri *Brongn.* 146
neuropteroides *Zeill.* . . 146
rogersi *Lesqx.* 146

NIGRITELLA *L.C.Rich.* 18

OCTOMERIA *R.Br.*
erosilabia *C.Schweinf.* . 85
exigua *C.Schweinf.* . . 86
iguapensis *Schltr.* . . . 86
integrilabia *C.Schweinf.* 87
minor *C.Schweinf.* . . . 89
parvifolia *Rolfe* 91
parvula *C.Schweinf.* . . 90
rigida *Rodr.* 90
tridentata *Lindl.* . . . 86

ODONTOPTERIS *Brongn.*
sp. nov. 146
genuina *G'E.* . 146, 147
reichi *Gutb.* . . 146, 147

OPHRIS L.
macrostachya La Llave & Lex. 120

OPHRYS *L.*
ensifolia Pav. apud Ridl. 117
monophyllos Pav. apud Lindl. 114

ORNITHIDIUM *Salisb.*
ramonense Schltr. . . . 41

PACHYSTELE Schltr.
corallorrhiza Ames . . . 40

PECOPTERIS *Brongn.*
arborescens *Schloth.* . . 146
bredovi *Germ.* 146
daubreei *Zeill.* . 146, 147
feminaeformis *Schloth.* . 146
polymorpha *Brongn.* . . 146
unita *Brongn.* 146

PELEXIA *Poit. apud L.C.Rich.*
Schaffneri Schltr. . . . 111

PERULARIA Lindl. . . . 18

PLATANTHERA L.C.Rich. 18

PLEUROTHALLIS *R.Br.*
barbulata *Lindl.* 83
biflora *Focke* 39
biflora Schltr. . . 39, 92
Blaisdellii *S.Wats.* . . . 43
Bradeorum (*Schltr.*) *A., H. & S.* 39
breviscapa *C.Schweinf.* . 79
choconiana S. Wats. 43, 44

ciliolata *Schltr.* 83
cruciformis *A., H. & S.* 39
diffusiflora *C.Schweinf.* . 80
dryadum *Schltr.* 39
dryadum Schltr. 39
funerea *Cogn.* 80
geminiflora *A., H. & S.* 39
hians *Lindl.* 82
hymenantha *Lindl.* . . . 85
integrilabia *A., H. & S.* 39
marginata *Lindl.* 43
minima *C.Schweinf.* . . . 82
panamensis Schltr. . 43, 44
peraltensis Ames 43
pergracilis Rolfe . . 43, 44
pertenuis *C.Schweinf.* . 83
prorepens (*Reichb.f.*) *A., H. & S.* 39
Reichenbachiana *Schltr.* 39
uniflora Lindl. 85
vittariifolia *Schltr.* 85

POACORDAITES *G'E.*
sp. 146

PONERORCHIS Reichb.f. 18

PROSTHECHEA Knowles & Westc.
glauca Knowles & Westc. 70

PSEUDOPECOPTERIS *Lesqx.*
cordato-ovata *Weiss.* . . . 147
sillimannii *Lesqx.* 147

RESTREPIA *HBK.*
prorepens Reichb.f. . . 40
Reichenbachiana Endres apud Reichb.f. 39

ROEPEROCHARIS *Reichb.f.* 18

SARCOGLOTTIS *Presl*
pubilabia Ames . 111, 112
Schaffneri (*Reichb.f.*) *Ames* 111
zamororae Ames 111, 112

SCAPHYGLOTTIS *Poepp. & Endl.*
corallorrhiza (*Ames*) *A., H. & S.* 40

SCHIEDEELLA Schltr.
saltensis Schltr. 128

SERAPIAS *L.*
parasitica Pav. apud Ridl. 114

SIGILLARIA *Brongn.*
brardi *Brongn.* 146

SPHENOPHYLLUM *Brongn.*
oblongifolium *G. & K.* 146
tenuifolium *F. & I.C.W.* 146

SPHENOPTERIS *Brongn.*
minutisecta *F. & I.C.W.* 146

SPIRANTHES *L.C.Rich.*
bracteolaris Kränzl. 129, 130
cinnabarina (*La Llave & Lex.*) *Hemsl.* 127
durangensis *A. & S.* . . 128
Galeottiana A.Rich. & Gal. 132, 133
gracilis (*Bigel.*) *Beck* . . 129
lucayana Cogn. 132
madrensis Hemsl. . . . 128
mechoacana Hemsl. . . 128
michuacana (*La Llave & Lex.*) *Hemsl.* 128
minutiflora *A.Rich. & Gal.* 130
montana Hemsl. 127
nutantiflora Schltr. 130, 131
polyantha *Reichb.f.* . . 132
Schaffneri Reichb.f. . . 111
saltensis Ames 128

saltensis *Griseb.* 128
sulphurea Hemsl. 128

STELIS *Sw.*
Alberti Schltr. 134
angustifolia *HBK.* . . . 164
apiculata Schltr. 43
atropurpurea Hook. . . . 167
ciliaris *Lindl.* 166
confusa Schltr. 171
crescentiicola *Schltr.* 54, 175
crystallina *Ames* 45
cyclopetala Schltr. . 159, 164
flexuosa Lindl. sensu Kränzl. 175
glossula *Reichb.f.* 149, 150, 151, 159
guianensis *Rolfe* . . . 78
inaequalis *Ames* 149, 150, 151, 155
insignis *Ames* 43
Isthmi Schltr. 175
Jimenezii Schltr. 171
latipetala *Ames* 45, 53, 175
longicuspis Schltr. . . . 134
ovatilabia *Schltr.* 159
pardipes *Reichb.f.* 134
perparva *C.Schweinf.* . . 77
praemorsa Schltr. 175
pusilla *HBK.* 164
rubens *Schltr.* 164
Storkii *Ames* 54
tenuissima *Schltr.* 59

STENOGLOTTIS *Lindl.* . 18

STENOPTERA *C.Presl*
costaricensis Schltr. . . 37

STENORRHYNCHUS *L.C.Rich.*
cinnabarinus Lindl. . . 127
Madrensis Reichb.f. 128, 129
Michuacanus Lindl. . . 128
montanus Lindl. 127
sulphureus Lindl. . . . 128

TAENIOPTERIS *Brongn.*
abnormis *Gutb.* . . 142, 144
angelica *D.W.* 143
carnoti *R. & Z.* 144
coriacea *Goepp.* 140, 143, 144
densissima *Halle* 145
eckhardti *Kurtze* . . . 143
fallax *Goepp.* 145
jejunata *G'E.* 139, 140, 141, 142, 143, 146, 147, 148
latecostata *Halle* . . . 145
lescuriana *F. & I.C.W.* 139, 140, 141, 144
missouriensis *D.W.* . . 142
multinervis *Weiss* . 140, 144
newberriana *F. & I.C.W.* 139, 140, 144
norini *Halle* 145
nystroemii *Halle* . . . 145
plauensis *Sterz.* 144
schenki *Sterz.* 145
serrata *Halle* 145
serrulata *Halle* 145
shansiensis *Halle* . . . 145
smithii *Lesqx.* . . 142, 145
tingii *Halle* 144
truncata *Lesqx.* 142
vittata *Brongn.* 139
Zeilleri *P.B.* 145

WALCHIA *Sternb.*
sp. 146
piniformis *Schloth.* . . . 146

ZEILLERIA *Kidst.*
sp. nov. 146

ZYGOPETALUM *Hook.*
lacteum Reichb.f. 41

ERRATA

page 39, line 21
for *Pleurothallis biflora* Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 395, non Focke (1849). read *Pleurothallis biflora* Schlechter in Fedde Repert. Beihefte 19 (1923) 181, non Focke (1849).

page 75, line 17
for *glumibracteatum* read *glumibracteum*

page 104, lines 22 and 25
for (1855) read (1858)

page 118, line 20
for Santa Martha read Santa Marta

page 120, line 10
add period after *lepidota*

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, SEPTEMBER 19, 1934 VOL. 3, NO. 1

NOTES ON MEXICAN EPIDENDRUMS BASED LARGELY ON THE ERIK M. ÖSTLUND COLLECTION

BY

OAKES AMES, F. TRACY HUBBARD AND CHARLES SCHWEINFURTH

THE MEXICAN SPECIES of Epidendrum have caused more difficulty, in our study of the genus, than those of any other portion of tropical North America. Two reasons for this may be given: first the scarcity of collections coming from this region and secondly the unrecognizable specific descriptions in two of the more important publications on Mexican orchids. These publications are Novorum vegetabilium descriptiones—Orchidianum opusculum by La Llave and Lexarza, and Orchidiographie mexicanae (in Ann. Sci. Nat. ser. 3, 3 (1845)) by A. Richard and H. G. Galeotti.

The study of the collection of Epidendrums represented in the herbarium of Mr. Erik M. Östlund of Cuernavaca, Morelos, Mexico has aided us not only to form a clearer conception of several doubtful species, but also to gain a surer knowledge of the characters of many little-known species. It contains seventy-two different forms, of which four are new species, three extend the known range (*E. conopseum* R. Br., *E. Schlechterianum* Ames and *E. verrucosum* Sw.) and four represent species which were very inadequately known.

Prior to the study of Östlund's material we recognized ninety-four valid species of Epidendrum as components of the Mexican flora. In addition to these ninety-four species there were eighteen species (largely those of La Llave and Lexarza and of A. Richard and Galeotti) which we consider indeterminable and five species which were reported as Mexican, or a possible total of one hundred and seventeen species which might occur in Mexico.

Of these the Ostlund Herbarium contains sixty-four or 58% a very remarkable showing. The following paper treats the novelties and amplifies the descriptions of three species which were previously uncertain owing to their rarity and lack of adequate description.

Epidendrum cyanocolumna *Ames, Hubbard & Schweinfurth, sp. nov.*

Herba pusilla, graminea. Radices pro planta crassae. Pseudobulbi graciles, ovoideo-conici, bi- vel trifoliati. Folia linearia, acuta. Inflorescentia saepius laxe paniculata. Flores rari, membranacei. Sepala lateralia oblonga vel oblongo-lanceolata, acuta. Sepalum dorsale oblanceolato oblongum, acutum. Petala oblanceolato-linearia. Labellum simplex, columnae basi adnatum, cuneato-spathulatum, leviter retusum, prope basim breviter bilamellatum. Columma alis binis erectis oblique triangularibus terminans.

Plant small, slender, up to 11 cm. tall. Roots stout for the plant, fibrous, flexuous, longitudinally sulcate when dry, whitish. Pseudobulbs approximate, 2- to 3-leaved, ovoid-conic, 5–14 mm. long, 2.5–6 mm. in diameter, covered by fibrous remains of sheaths. Leaves linear, grass-like, 3.7–9.5 cm. long, 2–3 mm. wide, acute, at base articulated to slender channelled conduplicate sheaths which are 5–9 mm. long. Inflorescence subequalling or slightly exceeding the leaves, sparsely and openly

paniculate (perhaps rarely racemose); peduncle and rachis filiform, below the floriferous portion provided with three or four loose scarious more or less evanescent sheaths. Floral bracts minute, amplexicaul, acute. Pedicellate ovary glabrous. Flowers membranaceous, sparse. Lateral sepals oblong to oblong-lanceolate, slightly oblique, 6.5–6.9 mm. long, 2.2–2.6 mm. wide, acute, 5-nerved. Dorsal sepal oblanceolate-oblong, 6.1–7 mm. long, 2–2.4 mm. wide, acute, 5-nerved. Petals oblanceolate-linear, about 6.3 mm. long, up to 1 mm. wide, subacute to obtuse, 1-nerved. Lip simple, adnate to the basal part of the column, cuneate-spatulate in outline, free portion of lamina 7–7.6 mm. long, 4–4.5 mm. wide, shallowly retuse at the apex, more or less distinctly indented on each side at the middle, margins irregularly subcrenulate; disc with a pair of short laminate keels below the middle. Column terminating in two prominent erect obliquely triangular wings, with a low small tooth located between them.

Epidendrum cyanocolumna is named from the wings of the column, which when first examined were sky-blue, the central tooth was red-purple. Its nearest ally is *E. tripunctatum* Lindl. (in Bot. Reg. 27 (1841) Misc. p. 66) from which it differs in having smaller flowers, an inflorescence subequalling or exceeding the leaves and much narrower petals.

The second specimen cited varies from the type in having three leaves (the type appears to be consistently 2-leaved). Furthermore, some of the veins of the lip show small crest-like protuberances near their extremity; these are apparently lacking in the type.

MEXICO, State of Puebla, north of Teziutlan. On trees. At 1,520 meters or more altitude. June 10, 1933. *Erik M. Östlund 2413* (Collector Juan G.). (TYPE in Herb. Ames No. 39432.): State of Tamaulipas, near Jaumave. June 13, 1932. *Erik M. Östlund 668* (Collector H. W. v. Roszinsky.)

Epidendrum Ghiesbreghtianum *A. Richard & Galeotti* in Comptes Rend. Acad. Sci. Par. 18 (1844) 512, *nomen*; in Ann. Sci. Nat. ser. 3, 3 (1845) 19.

Epidendrum Ghisbreghtianum Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 462, *sphalm.*

This species was originally inadequately described as follows: "Pseudobulbo oblongo diphyllo: foliis lanceolatis: scapo terminali bifloro; sepalis lanceolatis: labello amplo pallide violaceo, late subcordato, sinuoso. Aff. *E. ligulato* La Llave."

This description alone is too vague to make possible any helpful conception of the species, but it is clarified by the photograph of the type sheet in the Herb. Mus. Par., a tracing of Galeotti's drawing of the flower in the Reichenbachian Herbarium and photographs of sheets of this species in Herb. Kew. and Herb. Reichenbach. Unfortunately Galeotti's drawing is somewhat misleading as it shows what appears to be the more unusual form of lip and has led, we believe, to some confusion. Furthermore the sheet at Kew containing several collections, the data for which is mostly in the handwriting of R. A. Rolfe, has at least one envelope the contents of which Rolfe determined as *E. hastatum* Lindl., though the visible evidence places the material in *E. Ghiesbreghtianum*.

Among the collections of Epidendrum sent by Mr. Östlund, there was a sheet of what we believed to be a new species, but which fortunately Ames suggested bore earmarks of *E. Ghiesbreghtianum* and a restudy of a photograph of the type and other information available has convinced us that it represents that species.

The following amplified description drawn from the newly acquired Östlund specimens (supplemented by a sheet in the United States National Herbarium which has been restudied) and the information previously available will, we trust, clarify another of the obscure Mexican

species.

Plant 12.5–25 cm. high, provided at base with a rhizome. Roots numerous, fibrous. Pseudobulbs approximate, narrowly ovoid or fusiform, 3.2–6.5 cm. long, 5.5–11.1 mm. in diameter where broadest, 2- or sometimes 3-leaved, finely rugose in the dried specimens, obliquely ascending. Leaves ligulate or narrowly elliptic-ligulate, 7–16.9 cm. long, 6–12 mm. wide, acute to obtuse, long-conduplicate at base, subcoriaceous, apparently glaucous, mid-nerve sometimes rather prominent. Inflorescence up to 11.3 cm. long (scape including the rachis) 1- or 2-flowered as seen, with a prominent scarious sheath (about 3.7 cm. long in the Östlund specimen) at the base and near the middle of the peduncle a small amplexicaul scarious long-acuminate bract. Flowers large and showy, about 1.5–2 cm. apart. Sepals and petals maroon with narrow greenish white margins within, and olivaceous without in the dried (Östlund) specimen, fleshy. Lateral sepals obliquely lanceolate, 15–19 mm. long, 4.2–6 mm. wide, acuminate, dorsally carinate near the tip. Dorsal sepal lanceolate, 15–20 mm. long, 4–6 mm. wide. Petals lanceolate to elliptic-lanceolate, 14 18 mm. long, 2.7 4.5 mm. wide, acute to acuminate. Lip pure white with purple striae at the base of the side lobes (Östlund specimen), practically simple to 3-lobed near the base, suborbicular-quadrate or flabellate-reniform in outline, 16–27 mm. long (from base of column to extreme tip of lamina), 16–29 mm. wide, adnate to the column near the cuneate base, submembranaceous, abruptly broadened from a short-cuneate base; lateral lobes (if present) small, variable, free portion suborbicular, triangular, oblong-ovate or only lobulate; mid-lobe suborbicular or subquadrate-reniform, many times larger than the small lateral lobes, margin irregular and lobulate, apex apiculate, retuse or even deeply bilobed; disc fleshy-thickened at the base,

the thickening usually running out onto the three central veins which are farinaceous in their lower portion. Column short and very broad, very fleshy, about 5.4–6.5 mm. long, apex prominently 3-toothed, lateral teeth triangular, middle tooth larger, subquadrate and retuse or broadly rounded.

Epidendrum Ghiesbreghtianum is a close ally of *E. hastatum* Lindl., but has much larger flowers and 2-leaved pseudobulbs. It is undoubtedly in the same alliance with *E. venosum* Lindl. The aspect of its flowers is very suggestive of a Miltonia.

Mexico, State of Oaxaca, parasite sur les chênes. Mars. *Ghiesbreght 6* (Type in Herb. Mus. Par.); road between Plunia and San Miguel, Suchistepec. Altitude 8,500 feet. March 21, 1895. *E. W. Nelson 2506* (U. S. Nat. Herb.): State of Guerrero, near Chilpancingo. At 1,400 meters altitude. Collected in 1927, flowered at Cuernavaca March 18, 1932. *Erik M. Östlund 2779*: *Antonio* ex Kienast-Zolly, Zürich, August 1889 (Herb. Kew.)

Epidendrum Juergensii *Reichenbach filius* in Gard. Chron., ser. 2, 14 (1880) 524, in obs.

Epidendrum gladiatum Lindley in Bentham, Pl. Hartweg. (1840) 72, non Lindl., Gen. & Sp. Orch. Pl. (1831).

Epidendrum anisatum Lindley, Fol. Orch. Epid. (1853) p. 65, non La Llave & Lex.

This inadequately known species has caused considerable confusion. Lindley originally confused it with *E. gladiatum* Ruiz & Pav. and later believed that he was dealing with *E. anisatum* La Llave and Lex. Reichenbach stated that the Lindley conception of *E. anisatum* as represented by the Mexican collection of Hartweg from Rancho del Ojo de Agua could not be the plant described by La Llave and Lexarza. Unfortunately, however, Reichenbach failed to describe the species adequately and left us still dependent on the weak and somewhat faulty

description of Lindley and the Herbarium sheet of the Hartweg plant which bears a rather sketchy drawing of the lip made by Lindley.

Among the collections of Epidendrum from the Herbarium of Erik M. Östlund are two numbers which careful study has led us to believe represent the *E. Juergensii* of Reichenbach. We herewith give an amplified description of the species based on these collections, bearing in mind the sheet in the Lindley Herbarium.

Plant erect, 15–44 cm. tall. Roots long, coarse, fibrous, fasciculate, finely tomentose. Stems caespitose, simple, leafless below, concealed by close tubular scarious evanescent sheaths, bearing near the summit three to four leaves, about 2–3 mm. in diameter. Leaves narrowly lanceolate to linear-lanceolate, 3.6–17.8 cm. long, 4–8 mm. wide, acuminate to an obtuse apex, coriaceous, with the margins revolute in the dried specimen, mid-nerve prominently sulcate above and conspicuous beneath. Inflorescence much shorter than the leaves, strict, shortly paniculate with the branches subumbellate and more or less recurved. Peduncle to the lowest branch up to about 2.8 cm. long. Bracts of the inflorescence small (about 3–5 mm. long), relatively rather broad, scarious, concave, subacute. Flower long-pedicellate, rather small, membranaceous. Sepals and petals revolute. Lateral sepals asymmetrically obovate to obovate-lanceolate, 5–7 mm. long, 2.5–3 mm. wide, very oblique at the base and adnate to the column, acute, more or less cucullate above. Dorsal sepal obovate-oblong, 4.1–7 mm. long, about 2–2.9 mm. wide, rounded and apiculate or subacute at the apex. Petals oblong-spatulate, 5 7.3 mm. long, about 1–1.5 mm. wide, rounded to subacute. Lip adnate to the column to the apex of the column, reniform in outline, 3-lobed or 3-lobulate in front, 3–3.6 mm. long, 6–7.4 mm. wide, cordate at base; lateral lobes larger than the mid-lobe,

suborbicular, erose on the lateral and forward margins; mid-lobe suborbicular to broadly flattened-triangular (more protuberant in the Lindley drawing), retuse with rounded lobules; disc biallose at base, with three central parallel more or less evanescent fleshy lines. Column large for the flower, strongly dilated above, 4.5–5.6 mm. long.

Vegetatively (aside from being taller) the Östlund specimens agree in essential characters with the Hartweg plant. The flowers of the Hartweg specimen are approximately the same size and appear similar in outline, but the lip, as drawn by Lindley, has a more protuberant mid-lobe and lacks the erose margins. The drawing, however, seems to be rather sketchy.

The floral parts of the Östlund specimens appear to be suffused with purple, especially the petals, the column and the mid-lobe of the lip.

Mexico, Rancho del Ojo de Agua, April, *Hartweg s.n.* (Type in Herb. Kew. (Herb. Lindley)): State of Guerrero, near Carrizal, southwest of Chilpancingo. On oaks. At 800 meters altitude. November 12, 1932, flowered in greenhouse August 31, 1933. *Erik M. Östlund 1659* (Collector Juan G.); near "Los Fresnos", southwest of Guayaméo. In mixed oak and pine forest on trees. At 2,400 meters altitude. October 5, 1933. *Erik M. Östlund 3103* (Collector O. Nagel).

Epidendrum lancifolium *Pavon apud Lindley*, Gen. & Sp. Orch. Pl. (1831) 98.

Epidendrum Langlassei Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 404.

This species, based on a plant collected in Mexico by Pavon, has been a source of much perplexity. The original description is diagnostic, but not very full. The excellent plate in the Botanical Register (Bot. Reg. 28 (1842) t. 50) is not sufficiently detailed to make certain that a distinct species and not a variety of *E. cochleatum* L. is represented.

In 1918, Rudolf Schlechter described, under the

name of *E. Langlassei*, a species which we had believed constituted a distinct species. The lip showed striking variation both from *E. lancifolium* and from *E. cochleatum* in being less cochleate and somewhat 5-angled. Furthermore, the floral measurements were smaller and the calli as described were different, but it is nevertheless conspecific with *E. lancifolium*.

Among the specimens sent by Östlund were several which showed characters intermediate between *E. lancifolium* and *E. Langlassei*. Critical study of the group has convinced us that *E. lancifolium*, *E. Langlassei* and the Östlund specimens constitute a single variable species of which one extreme (the larger form with a more cochleate lip) is represented by the plate in the Botanical Register and the other extreme (the smaller form with a less cochleate and more or less 5-angled lip) is represented by the E. *Langlassei* of Schlechter.

The specimens of the Östlund collection referred to *Epidendrum lancifolium* show some differences from the form illustrated. All, in common with *E. Langlassei*, show a lip which is bicostate at base, that is with a central pair of more or less developed ridges or elongated swellings, while *E. lancifolium*, is described as having a lip which is tricostate at base. Furthermore, one of the Östlund specimens shows the sharply acute to short-acuminate leaves typical of *E. Langlassei*, whereas the others have the blunter more obtuse leaves typical of *E. lancifolium*. The flowers of the Östlund specimens are decidedly smaller than those of *E. lancifolium* (as illustrated), but about the same size as those of *E. Langlassei*. The 5-angled character of the lip seems very variable.

Mexico, *Pavon* (Type in Herb. Lambert (in Brit. Mus.?)); *Hort. Loddiges* (in Herb. Lindley): States of Michoacan and Guerrero, Campo Morado, *Langlassé 1057* (error of Schlechter *1059*): State of Guerrero, near Omiltemi, southwest of Chilpancingo. *Erik*

M. Östlund 814 (Collector Juan G.); near Joveritos, kilometer 353 road Mexico-Acapulco. *Erik M. Östlund 2436*: State of Michoacan, Mt. Palma Cuata near Uruapan. *Erik M. Östlund 2398* (Collector Pablo L.)

Epidendrum magnispatha *Ames, Hubbard & Schweinfurth, sp. nov.*

Herba epiphytica, robusta. Pseudobulbus breviter stipitatus, late ovoideus, bifoliatus. Folia elliptica, quam inflorescentia paulo breviora. Pedunculus spatha permagna conduplicata maxima pro parte obtectus. Racemus laxe pluriflorus. Flores magni. Sepala lateralia elliptica, obtusa. Sepalum dorsale oblanceolatum, apice rotundatum. Petala oblanceolato-elliptica, apice rotundata. Labellum columnae medio affixum; lamina transverse rhomboidea, trilobulata; lobi laterales rotundato-triangulares; lobus medius semicircularis; discus callo crasso mediano subquadrato apice in callum bulbosum extenso. Columna apice trilobata.

Plant stout, epiphytic, about 33.8 cm. tall to the tip of the uppermost flower. Roots large, fibrous, glabrous. Pseudobulb ovoid, abruptly dilated from a short stipitate base, bifoliate, about 8 cm. long including the base, 4.75 cm. in diameter, the lower portion concealed by the fibrous remains of sheaths. Leaves elliptic, 22–23.7 cm. long, 5.4–6.05 cm. broad, acute to subacute at the somewhat conduplicate and twisted apex, narrowed toward the base, subcoriaceous, many-nerved. Inflorescence racemose, loosely 8-flowered in the specimen observed, about 25 cm. long. Peduncle about 12.3 cm. long below the flowers, mostly concealed by a very conspicuous foliaceous spathe. Spathe about 11.4 cm. long, strongly conduplicate, the width 1.2 cm. from midrib to margin, apparently broadly rounded at the apex. Rachis about 9.5 cm. long. Flower large, about 4–4.5 cm. across the lateral sepals when expanded, with spreading segments. Pedicellate ovary about 2 cm. long, glabrous. Lateral

sepals elliptic, 2.2 cm. long, 7.5 mm. wide, obtuse to subacute. Dorsal sepal oblanceolate, about 2.1 cm. long, 7 mm. wide, obtuse. Petals similar to the dorsal sepal, oblanceolate-elliptic, about 2.1 cm. long, 6–6.5 mm. wide, rounded at the apex. Lip adnate up to the middle of the column, about 14 mm. long (tip of lip to base of column), 12 mm. broad across the lateral lobules; lamina transversely rhomboid in outline from a subquadrate claw, trilobulate with a shallow sinus on each side, about 8 mm. long; lateral lobes rounded-triangular, horizontally spreading; mid-lobe semicircular in general outline (appearing trilobulate on account of the bulbous thickening at its tip); disc provided in the center with a large fleshy subquadrate depressed callus, somewhat trilobulate at the apex which is produced into an obovoid bulbous thickening extending beyond the lamina. Column oblong in outline, slightly dilated above, prominently 3-toothed at the apex with rounded teeth, 1 cm. long dorsally.

Epidendrum magnispatha is allied to *E. favoris* Reichb.f. and to *E. Boothianum* Lindl. From both it differs in its much larger flowers. It is at once separable from *E. favoris* by the produced not emarginate mid-lobe of the lip and from *E. Boothianum* by its blunter perianth segments and rather differently shaped petals.

The flowers of *E. magnispatha* have the sepals and petals strongly blotched or spotted with reddish brown on a greenish gold ground, the lip is a clear golden yellow and the column is golden yellow with a red-brown base.

Mexico, State of Guerrero, mountains near Santo Domingo, north of Atoyac, in virgin forest on oaks, at 1,100 meters altitude. Collected January 1, 1933, flowered at Cuernavaca, November 23, 1933. *Erik M. Östlund 2043* (Collector O. Nagel) (Type in Herb. Östlund; flowers from type plant in Herb. Ames.)

Epidendrum Oestlundii *Ames, Hubbard &*

Schweinfurth, sp. nov.

Herba pseudobulbosa, elata. Pseudobulbus ovoideo-cylindraceus, bifoliatus. Folia duo, elliptico-ligulata, coriacea. Inflorescentia laxe et anguste paniculata. Flores parvi, carnosi. Ovarium pedicellatum laeve. Sepala lateralia spathulato-oblanceolata, acuta, apice dorso carinata. Sepalum dorsale simile. Petala spathulata, acuta. Labellum trilobatum, columnae basi adnatum; lobi laterales falcato-oblongi, apice oblique rotundati; lobus medius unguiculatus, lamina late triangulari-ovata, acuminata; discus medio callo crasso ovato sulcato ornatus. Columna brevis, abrupte reflexa.

Plant about 46 cm. tall. Roots fibrous, short, simple, whitish. Pseudobulb ovoid-cylindric, 4.8 cm. long, diphyllous, rugose and shining in the dried specimen. Leaves elliptic-ligulate, 20–25 cm. long, 2.6–2.95 cm. wide, apex apparently subacute (withered), coriaceous, mid-vein prominent beneath. Inflorescence narrowly and loosely paniculate, about 38 cm. long; pedumcle up to the panicle provided with remote short inconspicuous scarious sheaths; panicle 18.6 cm. long. Pedicellate ovary glabrous. Flowers small for the alliance, about 2 cm. across, rather fleshy. Lateral sepals obliquely spatulate-oblanceolate, 10.5–12 mm. long, 4 mm. wide above the middle, acute, dorsally carinate near the apex, somewhat concave. Dorsal sepal similar, about 9.4 mm. long, 3.8 4 mm. wide. Petals spatulate, 9.9 10.8 mm. long, 4.8 5 mm. wide, acute. Lip 3-lobed, adnate to the base of the column, 8.4–9 mm. long; lateral lobes falcate-oblong, rounded at the apex, free portion 3 3.2 mm. long, about 2 mm. wide in the middle, slightly broader at base; mid-lobe distinctly unguiculate, broadly triangular-ovate; lamina about 5 mm. long and 4.2 mm. wide, shortly acuminate, somewhat undulate toward the apex, veins thickened with the mid-nerve below the apex carinately

so; disc above the claw and the lower third of the mid-lobe provided with an ovate fleshy medianly channelled callus which extends into the thickened mid-nerve. Column short, abruptly reflexed near the base, exauriculate, 4.1–5 mm. long.

Epidendrum Oestlundii is closely allied to, but is separable from *E. selligerum* Batem. apud Lindl. in its smaller flowers and non-pandurate side-lobes of the lip.

Mexico, State of Guerrero, near Plan del Molino. In mixed forest on trees. At 400 meters or more altitude. Collected January 10, 1933 and flowered in Cuernavaca May 22, 1933. *Erik M. Östlund 2029* (Collector O. Nagel) (Type in Herb. Ames No. 39431.)

Epidendrum subulatifolium *A. Richard & Galeotti* in Comptes Rend. Acad. Sci. Par. 18 (1844) 510, 512, *nomen;* in Ann. Sci. Nat. ser. 3, 3 (1845) 21.

The non-diagnostic original description reads: "Fol. teretibus subulatis acutis: scapo 4-5-floro; flor. intense luteis parvulis: labello suborbiculari integro, sinuoso."

The only specimen of this species at Paris is one (*Galeotti 5326*) determined by Ames in September 1922. The type of the species (*Galeotti 5073*) was loaned to Reichenbach by A. Richard and was found by Ames at Vienna in the Reichenbachian Herbarium. There is also preserved in this herbarium the Galeotti water-color sketch of the species bearing an enlarged drawing (in color) of the flower. The herbarium sheets mentioned are of value in that they show the vegetative habit of the species; Galeotti's sketch, however, is sufficient to place the species.

In the material of Epidendrum sent for study by Mr. Östlund are two sheets which agree excellently with Galeotti's sketch. We herewith submit an amplified description of this heretofore uncertain species based upon these specimens and the data available from the photo-

graphs of the Galeotti specimens and the copy of the Galeotti sketch.

Plant very slender, 8.5–19 cm. tall, caespitose. Roots few, dilated from a slender base, verrucose. Stem entirely concealed by close tubular leaf-sheaths, 2.5–4.5 cm. long below the inflorescence, leafless below with the lowermost sheath aphyllous. Leaves elongate-subulate, 2.2–6.7 cm. long, 1 mm. or less wide, acute, strict. Inflorescence arcuate and loosely few-flowered, racemose or a few-flowered panicle. Peduncle up to inflorescence filiform, 1.2 7.2 cm. long, entirely invested by long tubular membranaceous sheaths. Bracts of the inflorescence inconspicuous, lanceolate, amplexicaul, scarious. Rachis flexuous. Flowers shades of yellowish brown according to the Galeotti sketch, small, apparently with spreading perianth segments when fresh, membranaceous. Sepals strongly concave. Lateral sepals elliptic-lanceolate, 6.8 mm. long, about 2.3 mm. broad when expanded, complicate-acute, dorsally carinate at the apex, oblique at base. Dorsal sepal similar, 6.3 mm. long, about 2 mm. broad when expanded. Petals oblanceolate-linear, 6 mm. long, 1 mm. broad above the middle, acute or subacute. Lip simple, in our specimen obovate in outline with a slightly contracted claw-like base(the Galeotti drawing shows a more round-ovate lip), exceeding the sepals, adnate about to the middle of the column, retuse in our specimen (apparently acute in the Galeotti sketch), about 5 -5.5 mm. long, 4.4 mm. wide, strongly plicate-undulate, margins erose; disc provided at the base with an ovate flattened paten, the three central nerves marked by low crenulate keels of which the lateral keel on each side is more or less branched. Column small, clavate, about 2.2 mm. long. Capsule ellipsoid, with a slender pedicel.

Epidendrum subulatifolium appears to have no very close allies.

Mexico, Oaxaca, fleures jaunes, en Mai. Sur les chênes des districts calcaires à 7800 ft., 1840. *Galeotti 5073* (Type in Herb. Reichenbach); Oaxaca, Sierra, 7,000 feet altitude, *Galeotti 5326*: State of Guerrero, Ojo de Agua in mountains near Mochitlán, in oak forest. June 20, 1932. *Erik M. Östlund 823* (Collector Juan G.).

Epidendrum tenuissimum *Ames, Hubbard & Schweinfurth, sp. nov.*

Herba gracillima, epiphytica. Radices paucae, crassae. Pseudobulbus ellipsoideus, prope apicem in collum angustum plurifoliatum contractus. Folia angustissime linearia. Inflorescentia folia subaequans, laxe pauciflora. Pedunculus filiformis. Flores membranacei. Sepala elliptico-lanceolata. Petala lineari-oblanceolata. Labellum prope apicem columnae adnatum, simplex, spathulato-oblongum, apice rotundatum; discus fascia mediana verrucosa percursa, utrinque carinis tribus humilibus crenulatis ornatus. Columna superne valde dilatata, apice trilobata.

Plant very slender, up to 15.4 cm. tall including the inflorescence. Roots few, fibrous, short, stout, glabrous. Pseudobulb ellipsoid, up to about 2.2 cm. long, covered by fibrous remains of sheaths, rugose in the dried specimen, contracted into a short caulescent neck which bears two to several leaves. Leaves narrowly linear, 8–10.7 cm. long, about 1.5–2 mm. wide (sometimes conduplicate), obtuse or subacute. Inflorescence equalling or exceeding the leaves, racemose or subpaniculate, few-flowered (three or four). Peduncle up to the raceme filiform, about 7.5–8.5 cm. long, concealed below by about two closely imbricating tubular scarious evanescent sheaths and provided above with two shorter remote tubular evanescent sheaths. Bracts of the inflorescence inconspicuous, small, scarious, amplexicaul. Flowers medium-sized but large for the plant, membranaceous. Lateral sepals oblong-lanceolate, 8.8–9.8 mm. long, about 2–2.5 mm. wide,

complicate-acute, dorsally carinate at the apex. Dorsal sepal similar, 8–9.6 mm. long, 2.5–2.7 mm. broad, obtuse or acute. Petals linear-oblanceolate, 8–10 mm. long, 1.4–1.9 mm. wide above the middle, acute or subacute. Lip simple, adnate nearly to the apex of the column, spatulate-oblong, 7 mm. or more long, 4–4.7 mm. wide, rounded, margin irregular; disc provided at base with an ovate paten and above with a broad verrucose band through the center and three low crenulate keels on each side. Column short, abruptly dilated above, 3-toothed at the apex, the lateral teeth more prominent and obliquely quadrate, about 4.1 mm. long to the apex of the lateral teeth.

Epidendrum tenuissimum is florally a close ally of *E. luteoroseum* A. Rich. & Gal., but differs from that species in the form of the petals and in the relative length of the sepals and petals. The disc of the lip also differs in having a broad verrucose band and six crenulate keels, whereas *E. luteoroseum* has five rows of papillae. Vegetatively *E. tenuissimum* is much smaller than *E. luteoroseum* and its leaves are very different.

Mexico, State of Michoacan, summit of Barranca de las Minas, about 25 kilometers southeast of Uruapan, on oaks. At 1,600 meters altitude. May 2, 1933. *Erik M. Östlund 2246* (Collecter O. Nagel) (Type in Herb. Ames No. 39911.)

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, OCTOBER 10, 1934 VOL. 3, NO. 2

A CONTRIBUTION TO OUR KNOWLEDGE OF THE ORCHIDS OF SPANISH HONDURAS PART II

BY

OAKES AMES

I. HABENARIEAE.

THE HABENARIEAE and associated genera are characterized by a persistent anther adnate to the column by a broad base and differ from all other orchids in having the caudiculae produced from the base of the pollinia. They belong to the Basitonae-Ophrydinae of Pfitzer's system of classification.

The Basitonae-Ophrydinae with few exceptions African and Eurasian in distribution comprise about fifty genera.

In Central America the Habenarieae, as limited by Bentham and Hooker, are represented by a single genus that includes approximately twenty-six species. Ten of these species are natives of Honduras. It is highly probable that additions will be made as exploration continues, because in Guatemala, a region with a flora comparable to that of Honduras, about sixteen species of Habenaria have been found.

The Habenarieae are essentially an Old World group whether taken in a conservative sense to include the genera admitted by Bentham and Hooker (*Genera Plantarum* 3 (1883)), or in a more liberal sense to include the

genera recognized by Pfitzer (in Engler and Prantl: *Die natürlichen Pflanzenfamilien*), or by Schlechter (in *Notizbl. Bot. Gart. u. Mus. Berl.* 9).

Bentham and Hooker admitted as valid genera, Arnottia *A. Rich.*, Bartholina *R. Br.*, Bicornella *Lindl.*, Bonatea *Willd.*, Cynorchis *Thou.*, Diplomeris *D. Don*, Glossula *Lindl.*, Habenaria *Willd.*, Hemipilia *Lindl.*, Herminium *L.*, Holothrix *L. C. Rich.*, Huttonaea *Harv.* and Stenoglottis *Lindl.* Of these genera only Habenaria is represented in the American flora. Pfitzer, however, regarded Habenaria, as limited by Bentham and Hooker, to be a conglomerate concept and he withdrew from it and returned to generic standing Barlaea *Reichb.f.*, Coeloglossum *Hartm.*, Deroemera *Reichb.f.*, Gymnadenia *R. Br.*, Montolivaea *Reichb.f.*, Nigritella *L. C. Rich.*, Perularia *Lindl.*, Platanthera *L. C. Rich.*, Ponerorchis *Reichb.f.*, and Roeperocharis *Reichb.f.*, to which genera Schlechter later added Blephariglottis *Raf.*, Gymnadeniopsis *Rydb.*, and Leucorchis *E. Mey.* Whatever view finally prevails with regard to the number of genera to be accepted as valid concepts, the point of chief interest for the student of Central American orchids is that the genera of the Habenaria alliance are overwhelmingly Eurasian and African and that Habenaria and Platanthera (the only Central American representatives of this alliance) are found in the Old World as well as in the New World.

Habenaria *Willd.*

The Honduranian representatives of this genus belong to the section characterized by protuberant stigmas. They are terrestrial or rarely subaquatic and, with few exceptions, have greenish flowers.

KEY TO THE SPECIES

a. Labellum simple, not tripartite

b. Ovary conspicuously winged with the wings minutely papillose on the edges

1. *H.alata* Hook.

b. Ovary not conspicuously winged

c. Labellum rounded at the base; spur shorter than or equal to the ovary

4. *H.eustachya* Reichb.f.

c. Labellum unidentate or sharply angled on each side at base; spur longer than the ovary

7. *H.odontopetala* Reichb.f.

a. Labellum tripartite

d. Spur at least 4 cm. long

e. Flowers few, rarely more than five

10. *H.setifera* Lindl.

e. Flowers numerous in a dense raceme

8. *H.Pringlei* B.L.Robins.

d. Spur considerably less than 4 cm. long

f. The longest leaf more than five times longer than broad, oblong

9. *H.repens* Nutt.

f. The longest leaf rarely four times longer than broad, narrowly or broadly elliptic

g. Flowers white, lateral segments of the labellum about equalling the middle segment

2. *H.clypeata* Lindl.

g. Flowers prevailingly green, lateral segments of the labellum exceeding the middle segment

h. Mid-nerve of the sepals, segments of the labellum and anterior segment of the petals papillose

3. *H.crassicornis* Lindl.

h. Sepals, labellum and petals smooth

i. Spur less than 1 cm. long

5. *H.hondurensis* Ames

i. Spur more than 1 cm. long

6. *H.novemfida* Lindl.

1. Habenaria alata *Hooker*, Exotic Flora 3 (1826) t. 169.

Habenaria stricta A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 29; Ames, Orch. 4 (1910) t. 78, fig. II.

Habenaria platantheroides Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 372.

The Honduranian specimen which I have referred to *Habenaria alata* Hook. differs from the type in having a simple labellum without a trace of basal protuberances or lobes. In this regard it resembles the Mexican *H. stricta* A. Rich. & Gal. and the Costa Rican species for which Schlechter proposed the name *H. platantheroides*. In recent studies of the Middle American Habenarias I have become convinced that in the recognition of segregates from *H. alata* the form of the labellum has been relied on too much and specific rank assigned to plants hardly entitled to recognition as varieties, *H. stricta* and *H. platantheroides* being in this category. Unfortunately the identity of *H. stricta* is revealed only through analytical drawings preserved in the herbarium of the Muséum d'Histoire Naturelle in Paris. The dried specimen has disappeared and in its absence the analytical drawings are the only evidence on which to interpret the original description and to form a conception

of the species.

Habenaria alata is widespread and polymorphic. It is common in the West Indies and has appeared again and again in collections received from Mexico, Guatemala, Salvador, Costa Rica, Panama and South America. The narrowly lanceolate, obliquely ascending leaves; the conspicuously winged ovary with the edges of the wings minutely papillose, and the more or less connivent sepals with minutely papillose margins, are constant characters. The labellum, however, is variable. Commonly it has a triangular protuberance on each side near the base. Sometimes these protuberances are so strongly developed that they give to the labellum a three-lobed appearance, but frequently they are so much reduced that they become inconspicuous or obsolete. Lacking other substantial differences, the absence from the labellum of lateral protuberances is a trivial characteristic by which to segregate species.

Department of Comayagua, North of Siguatepeque. Terrestrial in open pine forest at 3,400 feet altitude. October 6, 1932. *Edwards 280.*

Illustration: 1, flower drawn with the aid of the camera lucida, enlarged about two times. 2, flower drawn with the lateral sepals spread apart. 3, labellum, spur and column, drawn with the aid of the camera lucida, enlarged about four times. 4, a section taken from the margin of a sepal to show papillose character. 5, petal about four times life-size.

Drawn July 1934 from flowers of Edwards 280 by Blanche Ames.

2. Habenaria clypeata *Lindley*, Gen. & Sp. Orch. Pl. (1835) 311.

Habenaria lactiflora A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 28.

The specimens referred to *H. clypeata* are perplexing because several of them approach the type of *H. lactiflora*. The lateral segments of the labellum are basal or sometimes, together with the mid-lobe or middle segment, separated from the base of the labellum by a well-devel-

EXPLANATION OF ILLUSTRATION

HABENARIA CLYPEATA *Lindl.* Flower enlarged, about twice natural size, drawn from flowers of *Edwards 184* preserved in alcohol. The labellum with its conspicuous claw below the lateral segments represents the variant formerly referred to *H. lactiflora.*

HABENARIA CRASSICORNIS *Lindl.* Plant natural size, drawn from a dried specimen of *Edwards 206.* Flower enlarged, about twice natural size, drawn from a flower of *Edwards 477* preserved in alcohol.

HABENARIA EUSTACHYA *Reichb.f.* Flower enlarged, about twice natural size, drawn from a flower of *Edwards 592* preserved in alcohol.

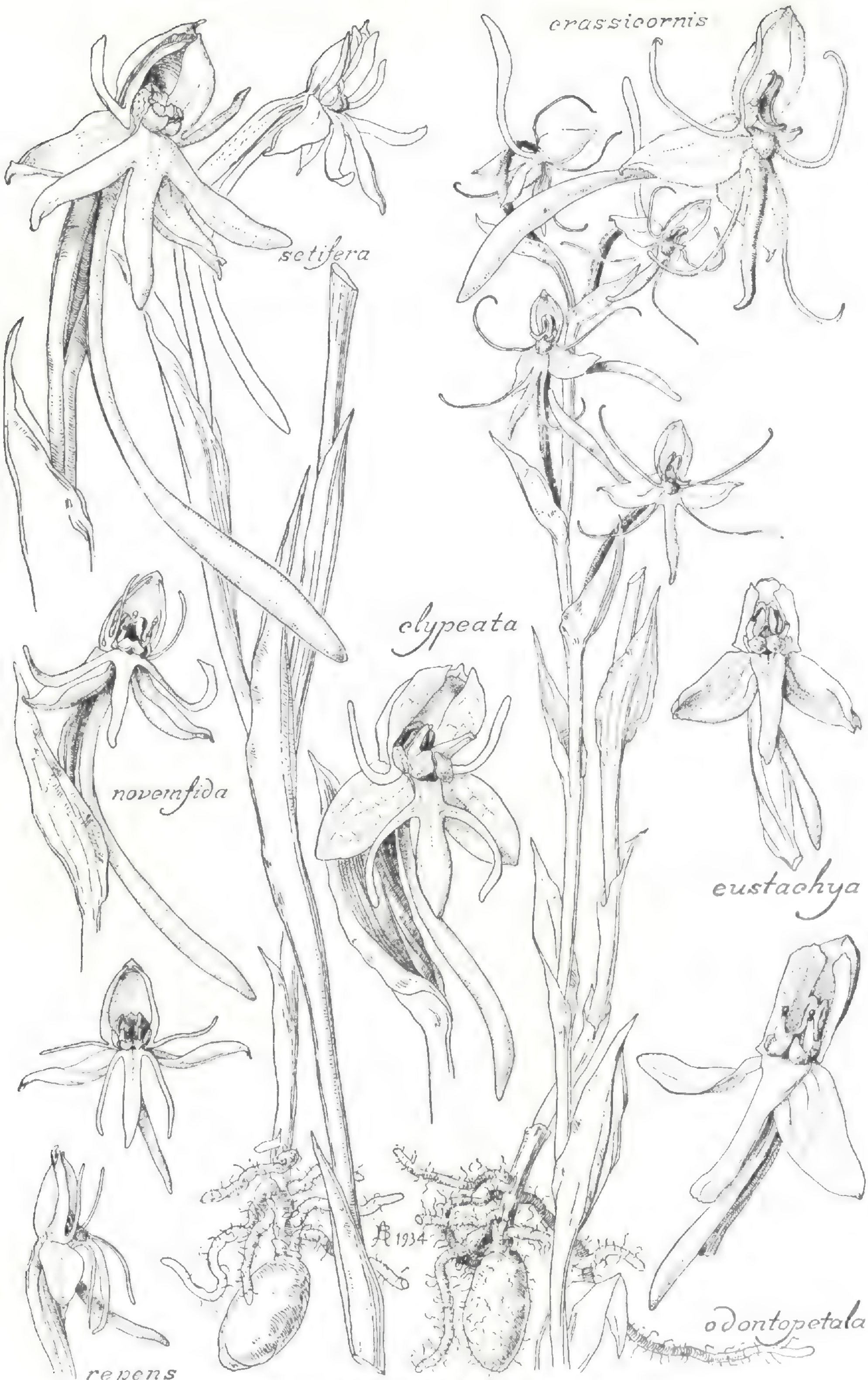
HABENARIA NOVEMFIDA *Lindl.* Flower enlarged, about twice natural size, drawn from a flower of *Edwards 488* preserved in alcohol.

HABENARIA ODONTOPETALA *Reichb.f.* Flower enlarged, about twice natural size, drawn from a flower of *Edwards 483* preserved in alcohol.

HABENARIA REPENS *Nutt.* Two flowers enlarged, about twice natural size, drawn from flowers of *Edwards 386* preserved in alcohol.

HABENARIA SETIFERA *Lindl.* Plant natural size. Flower about one third larger than natural size, drawn from a flower of *Edwards 203* preserved in alcohol.

Drawn July 1934 by BLANCHE AMES


crassicornis
setifera
clypeata
novemfida
eustachya
odontopetala
repens

HABENARIA

oped claw and are either shorter than or about equal to the mid-lobe. In Orchidaceae 4 (1910) 240, I directed attention to the lack of satisfactory characters separating *H. clypeata* from *H. lactiflora*. The place of origin of the lateral segments of the labellum had to be relied on for specific distinction; the lateral segments being basal or nearly so in *H. clypeata* and conspicuously above the base of the labellum in *H. lactiflora*. The Honduranian specimens indicate that this is a very weak distinction and also indicate that the point of origin of the lateral segments of the labellum is a doubtful guide to specific separation.

Habenaria spithamaea Schltr., a native of Guatemala, is probably a variant of this species.

Habenaria clypeata is rare and heretofore has been known only from Mexico and Guatemala.

Department of Comayagua, San Luis. Terrestrial in pine forest at 4,200 feet altitude. Flowers white. June 10, 1932. *Edwards 184*: Jicarito. Terrestrial in boggy ground at 2,000 feet altitude. Flowers white. July 24, 1933. *Edwards 462*.

3. Habenaria crassicornis *Lindley*, Gen. & Sp. Orch. Pl. (1835) 311.

Habenaria adenantha A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 28.

The Honduranian specimens which I have referred to *Habenaria crassicornis* differ from the type in having the segments of the labellum and petals inconspicuously papillose. At most there are papillose protuberances at the base of the anterior segments of the petals and at the base of the lobes of the labellum. The mid-nerve of the sepals, and the ovaries, on the other hand, are conspicuously papillose.

I suspect that *Habenaria quinquefila* Schltr., a native of Guatemala, is a very close ally of *H. crassicornis* and doubtfully separable from it.

Habenaria crassicornis is also a native of Mexico and Guatemala.

Department of Tegucigalpa, San Juancito. In cloud-forest at 5,000 to 6,000 feet altitude. 1931. *Edwards 23*: La Segobia. Terrestrial at 3,000 feet altitude. Flowers light olive. September 17, 1931. *Edwards 34.*

Department of Comayagua, Temagua. Terrestrial in wet ground in open forest at 2,000 feet altitude. Sepals and spur pea-green, petals labellum and column white. August 5, 1933. *Edwards 477*: Minas de Oro. Terrestrial in mountain-forest at 4,500 feet altitude. Sepals and petals green, labellum brown. July 9, 1932. *Edwards 206.*

4. Habenaria eustachya *Reichenbach filius* in Ber. Deutsch. Bot. Gesell. 3 (1885) 274.

This is a widely distributed species which has been found in Mexico, Guatemala and the West Indies.

Department of Cortes, Santa Cruz de Yojoa. Terrestrial in soggy ground at 2,000 feet altitude. Flowers green. November 14, 1933. *Edwards 592.*

5. Habenaria hondurensis *Ames, sp. nov.*

Herba terrestris e tubere carnoso ovoideo enata. Caulis erectus, bene foliatus, internodiis abbreviatis. Folia anguste elliptica, acuta vel obtusa. Bracteae inflorescentiae foliaceae. Racemus cylindraceus, elongatus, multiflorus. Pedicellus cum ovario valde alato oblique adscendens. Sepala lateralia inaequaliter lanceolata, margine papillosa, apice cymbiformia, rostrata, nervo medio carinata. Sepalum dorsale valde concavum, ovatum, acutum, trinervium. Petala bipartita, partitionibus valde inaequalibus; posteriore anguste oblonga; anteriore subulata, valde elongata. Labellum tripartitum, lacinia intermedia lineari-oblonga, acuta, trinervia, laciniis lateralibus filiformibus, valde elongatis. Columna generis.

Terrestrial herb 24.5–31 cm. tall from an ovoid tuberoid 1.5–2 cm. long. Leaves 3.5–7 cm. long, 1.2–2.6 cm.

wide, about five in number, alternate, loosely sheathing the stem, narrowly to broadly elliptic, acute or obtuse, diminishing above into narrowly lanceolate, acute bracts. Raceme slender, 9–12 cm. long, 1.5–2.5 cm. in diameter, bearing twenty to thirty or more greenish flowers. Bracts of the raceme 0.5–1 cm. long, ascending, equalling or shorter than the pedicellate ovary, narrowly lanceolate, acuminate, acute. Pedicellate ovary about 1 cm. long, obliquely ascending, conspicuously alate with the edges of the alae papillose. Flowers about 5 mm. apart in the raceme. Lateral sepals 5 mm. long, 1.5 mm. wide, asymmetrically lanceolate, cymbiform at the apex with the mid-nerve prominent on the outer surface and produced into a rostrate point. Dorsal sepal similar, 5 mm. long, 3–4 mm. wide, ovate, acute, strongly concave, 3-nerved. Petals bipartite with the posterior segment 4–5 mm. long, 0.75–1 mm. wide, narrowly oblong, acute, 1-nerved through the middle with a supplementary nerve arising as a branch from the nerve of the anterior segment; anterior segment 7 mm. long, filiform, erect. Labellum tripartite, lateral segments 8–9 mm. long, filiform; middle segment 5 mm. long, scarcely 1 mm. wide, linear-oblong, 3-nerved, acute. Spur pendent, 8 mm. long, hardly inflated below the middle, cylindrical. Stigmatic processes prominent, semi-ovoid.

Closely allied to *Habenaria tetranema* Schltr., a Guatemalan species, from which it differs conspicuously in the shorter spurs and in the aspect of the foliage. From *H. novemfida* Lindl., it is easily distinguishable in having much smaller flowers in more slender racemes.

Department of Comayagua, Vicinity of Siguatepeque (El Achote). Terrestrial in open mountain-forest at 3,900 feet altitude. Flowers pea-green. September 27, 1932. *Edwards 267*. (Type in Herb. Ames No. 40088.)

6. Habenaria novemfida *Lindley* in Bentham Pl.

EXPLANATION OF ILLUSTRATION

HABENARIA HONDURENSIS *Ames*. Plant drawn natural size with the aid of the camera lucida. 1, flower enlarged four times, front-view. 2, flower enlarged four times, side-view; anterior segments of the petals not fully developed. 3, petal enlarged five and one-half times. Figures 1, 2 and 3 drawn from the type with the aid of the camera lucida.

Drawn from dried specimens July 1934 by
BLANCHE AMES

HABENARIA *hondurensis* Ames

Hartweg. (1842) 94.

Habenaria diffusa A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 28.

The specific name is misleading and rests on an error in observation. Lindley described the petals as being trifid, hence the petals and labellum would constitute a nine-lobed corolla. In 1910 the type was restudied and the petals were found to be bipartite.

Habenaria novemfida is also a native of Mexico, Guatemala and Salvador.

Department of Yoro, La Concepción. Terrestrial in boggy ground in dense forest at 2,500 feet altitude. Flowers green. August 13, 1933. *Edwards 488.*

7. Habenaria odontopetala *Reichenbach filius* in Linnaea 18 (1844) 407.

This is a widespread species ranging, without apparent change of character, from Florida to the West Indies, Mexico, and Guatemala.

Habenaria Selerorum Schltr., a native of Guatemala, is a very close ally of *H. odontopetala* and may prove to be inseparable from it. *H. Jimenezii* Schltr., a native of Costa Rica, resembles very closely *H. odontopetala*, and should be regarded with suspicion until more material has been studied.

Department of Yoro, La Concepción. Terrestrial in wet ground at 2,500 feet altitude. Flowers green. August 9, 1933. *Edwards 483.*

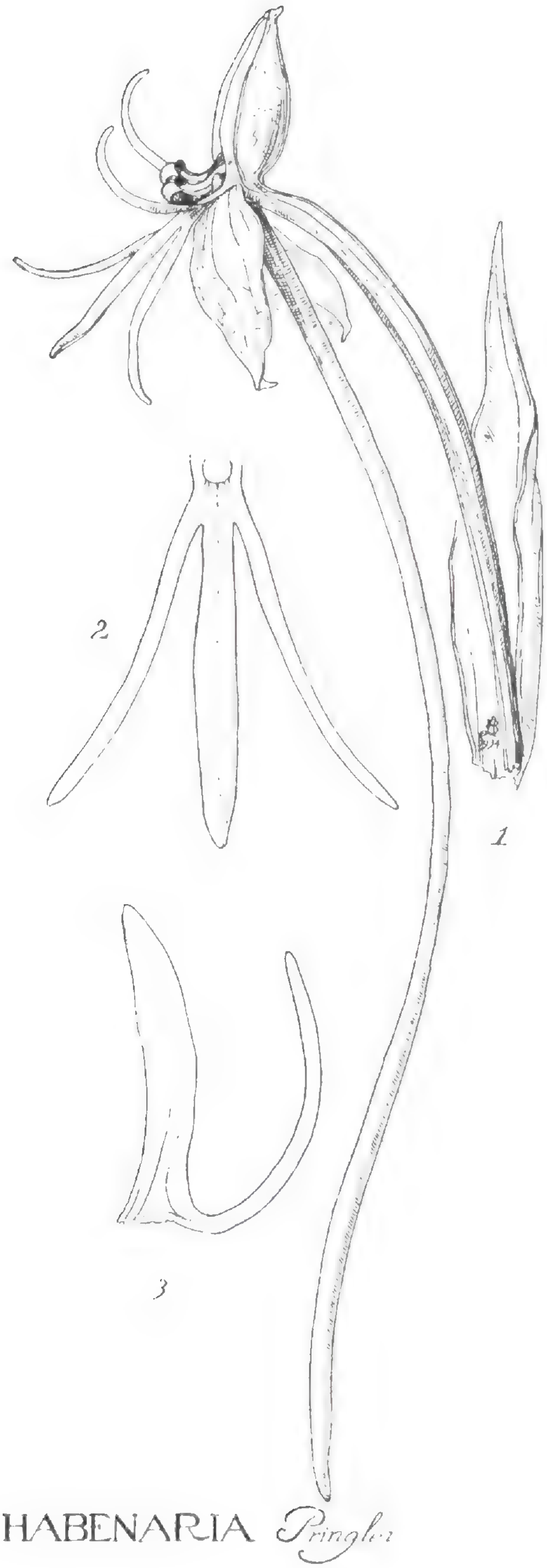
8. Habenaria Pringlei *B. L. Robinson* in Proc. Amer. Acad. 27 (1892) 184.

This species ranges from the state of San Luis Potosi in Mexico through Guatemala to Honduras. The sepals are 1.5 cm. long and the divisions of the labellum may exceed 2.5 cm. in length. The extraordinarily large flowers are white and make this species one of the most showy of the genus. It differs from the closely related *H. mac-*

EXPLANATION OF ILLUSTRATION

HABENARIA PRINGLEI *B. L. Robinson.* 1, flower natural size drawn from a Mexican specimen with the aid of the camera lucida. 2, labellum, spur removed, about twice enlarged. 3, petal about twice enlarged.

Drawn August 1934 by BLANCHE AMES



HABENARIA *Pringlei*

roceratitis Willd. in the narrower leaves. The spur varies conspicuously in length, being hardly 5 cm. long in some of the Guatemalan forms.

Department of Santa Barbara, San Pedro Sula. Las aranales in laguna. March 24, 1889. *Carl Thieme 739.* (No. 5552 of John Donnell Smith's distribution).

9. Habenaria repens *Nuttall*, Gen. No. Amer. Pl. 2 (1818) 190.

This is one of the most common and widely ranging species of Habenaria. It has been reported from the southern United States (North Carolina to Florida), Mexico, British Honduras, Guatemala, Nicaragua, Costa Rica, Panama, the West Indies and South America.

A striking peculiarity of this species is its adaptation to life in wet places. Again and again it is reported as being associated with aquatic plants or floating vegetation. Mr. Edwards found his specimens associated with floating plants in Lake Yojoa or in very wet ground. In Hooker's Icones Plantarum, ser. 4, 7 (1901) t. 2686, R. A. Rolfe referred to it as being aquatic or subaquatic, and in The Plant World 6 (1903) 165, Roland M. Harper reported it from Georgia where he found specimens supported on floating masses of the water-hyacinth (*Eichhornia crassipes*) in water six feet deep. In response to its adaptation to wet surroundings, *H. repens* develops a copious root-system without tuberoids.

Department of Comayagua, Pito Solo, Lake Yojoa. On floating masses of water-weeds and grass at 2,000 feet altitude. Flowers light green. August 24, 1932. *Edwards 89.*

Department of Cortes, El Jaral, Lake Yojoa. On floating islands of water-plants at 2,000 feet altitude. Flowers green. October 30, 1932. *Edwards 306*; Terrestrial on marshy ground at 2,000 feet altitude. Flowers green. March 21, 1933. *Edwards 386.*

10. Habenaria setifera *Lindley* in Ann. & Mag. Nat. Hist. 4 (1840) 381.

Habenaria spathacea A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 29.

The type of *H. setifera* was collected in Mexico by Hartweg. Dr. Schlechter reported this species as being also a native of Costa Rica.

Habenaria Endresiana Schltr. (in Fedde Repert. Beihefte 19 (1923) 272) is a closely allied Costa Rican species differing so slightly from *H. setifera* that its distinctness is open to suspicion.

Department of Comayagua, Minas de Oro. Terrestrial in open mountain-forest at 4,200 feet. Flowers light green or nearly white. July 4, 1932. *Edwards 203*: San Luis. Terrestrial at 4,000 feet altitude. Sepals light green, petals and labellum white. September 19, 1931. *Edwards 56*.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, DECEMBER 27, 1934 VOL. 3, NO. 3

CRITICAL NOTES ON COSTA RICAN ORCHIDS

BY

OAKES AMES, F. TRACY HUBBARD AND CHARLES SCHWEINFURTH

IN THE PREPARATION of an enumeration of the orchids of Costa Rica, two new varieties were noted and it was found necessary to make a number of new combinations and new names. The present paper describes the novelties and makes the necessary nomenclatorial changes.

Gomphichis costaricensis (*Schltr.*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Stenoptera costaricensis Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 375.

Since we consider *Stenoptera costaricensis* to be a Gomphichis and not a Stenoptera, the transfer to that genus necessitates a new combination.

Goodyera erosa (*A. & S.*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Epipactis erosa Ames & Schweinfurth in Sched. Orch. 10 (1930) 9.

This species has not been transferred to Goodyera heretofore and therefore necessitates a new combination.

Lepanthes Lindleyana *Oerst. & Reichb.f.* var. **angustifolia** *Ames, Hubbard & Schweinfurth, var. nov.*

A typo foliis linearibus vel peranguste lanceolatis differt.

Leaves up to about 4.6 cm. long (3.9 cm. long in the type, 4.6 cm. long in *Stork 1699*), rarely up to 4 mm. wide, commonly appearing fleshy with revolute margins. Otherwise as in the type.

Costa Rica, Province of San José. Oak forest near Quebradillas, about 7 km. north of Santa María de Dota. At about 1,800 meters altitude. December 24, 1925. *Paul C. Standley 43071* (Type in Herb. Ames No. 32871); Same data, *Paul C. Standley 43083*: Santa María. At 5,600 feet altitude. May 4, 1928. *H. E. Stork 1699*.

Lepanthes Lindleyana *Oerst. & Reichb. f.* var. **major** *Ames, Hubbard & Schweinfurth, var. nov.*

Lepanthes fimbriata Ames in Sched. Orch. 3 (January 1923) 11.

Lepanthes pubilabia Schlechter in Fedde Repert. Beihefte 19 (November 1923) 282.

A typo plus minusve major, praesertim foliis ovatis vel elliptico-ovatis differt.

Plant up to 10 cm. tall. Leaves ovate, round-ovate or elliptic-ovate, up to 4.1 cm. long and 2.2 cm. wide (2.2 cm. wide in *Stork 2063*). Sepals ovate, up to 4 mm. long (4 mm. long in the type of *L. pubilabia*), smooth on the margins and veins. Lamina of the lateral sepals scarcely broader than the dorsal sepal. Mid-lobe of lip more conspicuous than in the type.

Costa Rica, Carpintera. At 5,000 feet altitude. Flowers brick-red. October 1923. *C. H. Lankester 54-3* (Type in Herb. Ames No. 27757): At 5,000 feet altitude. Petals orange, lip red. May 20, 1928. *H. E. Stork 2063* (Collector Karl Danielson): Ochomogo. At 1,570 meters altitude. Flowers coral-red, sepals dark. September 4, 1925. *A. Alfaro 165*: Alto de Ochomogo. At 1,550 meters altitude. December 1896. *A. Tonduz* (Herb. Inst. physico-geogr. nat. costaric. 10387) (Type of *L. fimbriata*): Vicinity of San Ramon. 1921. *G. Acosta s.n.* (Type of *L. pubilabia*).

Pleurothallis Bradeorum (*Schltr.*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Barbosella Bradeorum Schlechter in Fedde Repert. Beihefte 19 (1923) 111.

We consider the genus *Barbosella* Schltr. to be congeneric with *Pleurothallis* R. Br. The combination for this species under *Pleurothallis* has not been made previously.

Pleurothallis cruciformis *Ames, Hubbard & Schweinfurth, nom. nov.*

Restrepia Reichenbachiana Endres apud Reichenbach filius in Gard. Chron. n.s. 4 (1875) 356.

Barbosella Reichenbachiana Schlechter in Fedde Repert. Beihefte 19 (1923) 26.

We consider that this species belongs in Pleurothallis. In transferring it to that genus a new name is rendered necessary owing to the already existing *P. Reichenbachiana* Schltr. (1921). The new name refers to the cross-like appearance of the flower.

Pleurothallis geminiflora *Ames, Hubbard & Schweinfurth, nom. nov.*

Pleurothallis biflora Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 395, non Focke (1849).

Owing to the prior use of the combination *Pleurothallis biflora* by Focke in 1849 its use by Schlechter in 1918 is invalid, making a new name necessary.

Pleurothallis integrilabia *Ames, Hubbard & Schweinfurth, nom. nov.*

Pleurothallis dryadum Schlechter in Fedde Repert. Beihefte 19 (1923) 186, non Schltr. (1922).

Owing to the prior use of the combination *Pleurothallis dryadum* by Schlechter in 1922 its use by Schlechter in 1923 is invalid, making a new name necessary.

Pleurothallis prorepens (*Reichb.f.*) *Ames, Hub-*

bard & Schweinfurth, comb. nov.

Restrepia prorepens Reichenbach filius in Gard. Chron. n.s. 7 (1877) 810.

Barbosella prorepens Schlechter in Fedde Repert. 15 (1918) 263.

This species has not heretofore been placed in Pleurothallis and its transfer to that genus makes a new combination necessary.

Malaxis Parthonii *Morr.* var. **denticulata** (*Reichb.f.*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Microstylis Parthoni Reichb.f. var. *denticulata* Reichenbach filius, Beitr. Orch. Centr.-Am. (1866) 100.

Microstylis Wercklei Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 382.

Malaxis Wercklei Ames in Proc. Biol. Soc. Wash. 35 (1922) 85.

The transfer of this variety to Malaxis has not been made previously.

Hexisea Amparoana (*Schltr.*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Costaricaea Amparoana Schlechter in Fedde Repert. Beihefte 19 (1923) 31.

We consider the genus *Costaricaea* Schltr. to be congeneric with *Hexisea* Lindl. The combination for this species under Hexisea has not been made previously.

Scaphyglottis corallorrhiza (*Ames*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Pachystele corallorrhiza Ames in Sched. Orch. 9 (1925) 45.

We consider the genus *Pachystele* Schltr. to be congeneric with *Scaphyglottis* Poepp. & Endl. The combination for this species under Scaphyglottis has not been

made previously.

Bletia Lankesteri (*A. & S.*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Limodorum Lankesteri Ames & Schweinfurth in Sched. Orch. 10 (1930) 78.

As this species has not heretofore been recorded under Bletia a new combination is necessitated. The retention of Limodorum as the generic name of the well-known European species, *L. abortivum* Sw., restores Bletia as a valid generic name.

Kefersteinia lactea *Reichenbach filius* apud B. D. Jackson in Index Kewensis 2 (1895) 4.

Zygopetalum lacteum Reichenbach filius in Gard. Chron. (1872) 1290.

The authority usually cited for the combination *Kefersteinia lactea* is Reichb.f. in Gard. Chron. (1872) 1290. The actual combination published there is Zygopetalum (Kefersteinia) lacteum, *n. sp.* The earliest appearance of the combination *Kefersteinia lactea* that we have found is in Index Kewensis, as cited above.

Maxillaria angustissima *Ames, Hubbard & Schweinfurth, nom. nov.*

Maxillaria acutifolia Schlechter in Fedde Repert. Beihefte 19 (1923) 229, non Lindley (1839).

Owing to the prior use of the combination *Maxillaria acutifolia* by Lindley in 1839 its use by Schlechter in 1923 is invalid, making a new name necessary.

Maxillaria flava *Ames, Hubbard & Schweinfurth, nom. nov.*

Ornithidium ramonense Schlechter in Fedde Repert. Beihefte 19 (1923) 243, non *Maxillaria ramonensis* Schltr.

We consider that this species is referable to Maxillaria rather than to Ornithidium. As there is already a *Maxillaria ramonensis* Schltr., a new name is rendered necessary in transferring the species.

NOMENCLATORIAL NOTES

BY

CHARLES SCHWEINFURTH

Stelis insignis *Ames* in Sched. Orch. 1 (1922) 5.

Stelis apiculata Schlechter in Fedde Repert. Beihefte 7 (1920) 84; 57 (1929) t. 28, fig. 105, non Lindley (1858).

On receipt of the analytical floral drawing of *Stelis apiculata* Schltr., it appeared that *S. insignis* was inseparable from that species. However, the name apiculata is invalidated by the prior use of the name by Lindley in 1858 and therefore the later name insignis should replace it.

Pleurothallis Blaisdellii *S. Watson* in Proc. Amer. Acad. 23 (1888) 284.

Pleurothallis peraltensis Ames in Sched. Orch. 6 (1923) 65.

A comparison of the type material of these species fails to show any structural difference between them. In each species the number of racemes borne by a single stem appears to vary, being commonly one or two in *P. Blaisdellii* and often numerous in *P. peraltensis*.

Pleurothallis marginata *Lindley* in Bot. Reg. 24 (1838) Misc. p. 42.

Pleurothallis choconiana S. Watson in Proc. Amer. Acad. 23 (1888) 285.

Pleurothallis pergracilis Rolfe in Kew Bull. (1893) 334.

Pleurothallis panamensis Schlechter in Fedde Repert. 17 (1921) 140.

The type of *P. chocoiana* agrees very well with the typical form of *P. marginata*, except that it has the lateral sepals entirely or mostly connate whereas the records of

typical *P. marginata* show them only semiconnate. This character, however, is known to be extremely variable in the genus Pleurothallis.

Pleurothallis pergracilis, as shown by specimens compared with the type of that species, is identical with *P. choconiana*.

The type description of *P. panamensis* claims several characters that differentiate it from *P. marginata* such as the smaller size of the leaves, and the narrower petals and lip. However, the drawing of the type specimen shows a plant surely not specifically separable from *P. marginata*, and the alleged floral characters of *P. panamensis* are present in otherwise normal *P. marginata*.

Pleurothallis marginata is thus seen to be widely distributed through Middle America, extending from Mexico to Panama.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, JANUARY 15, 1935 VOL. 3, NO. 4

STUDIES IN STELIS. III.

BY

OAKES AMES

THREE NEW SPECIES of Stelis are described and illustrated in this paper. Two of these species belong to the section of the genus that is characterized by stigmatiferous lateral lobes at the apex of the column. The third species, *Stelis latipetala*, belongs to that section in which the species have the stigmas confluent on the anterior surface of the column beneath the triangular rostellum.

Stelis crystallina *Ames sp. nov.*

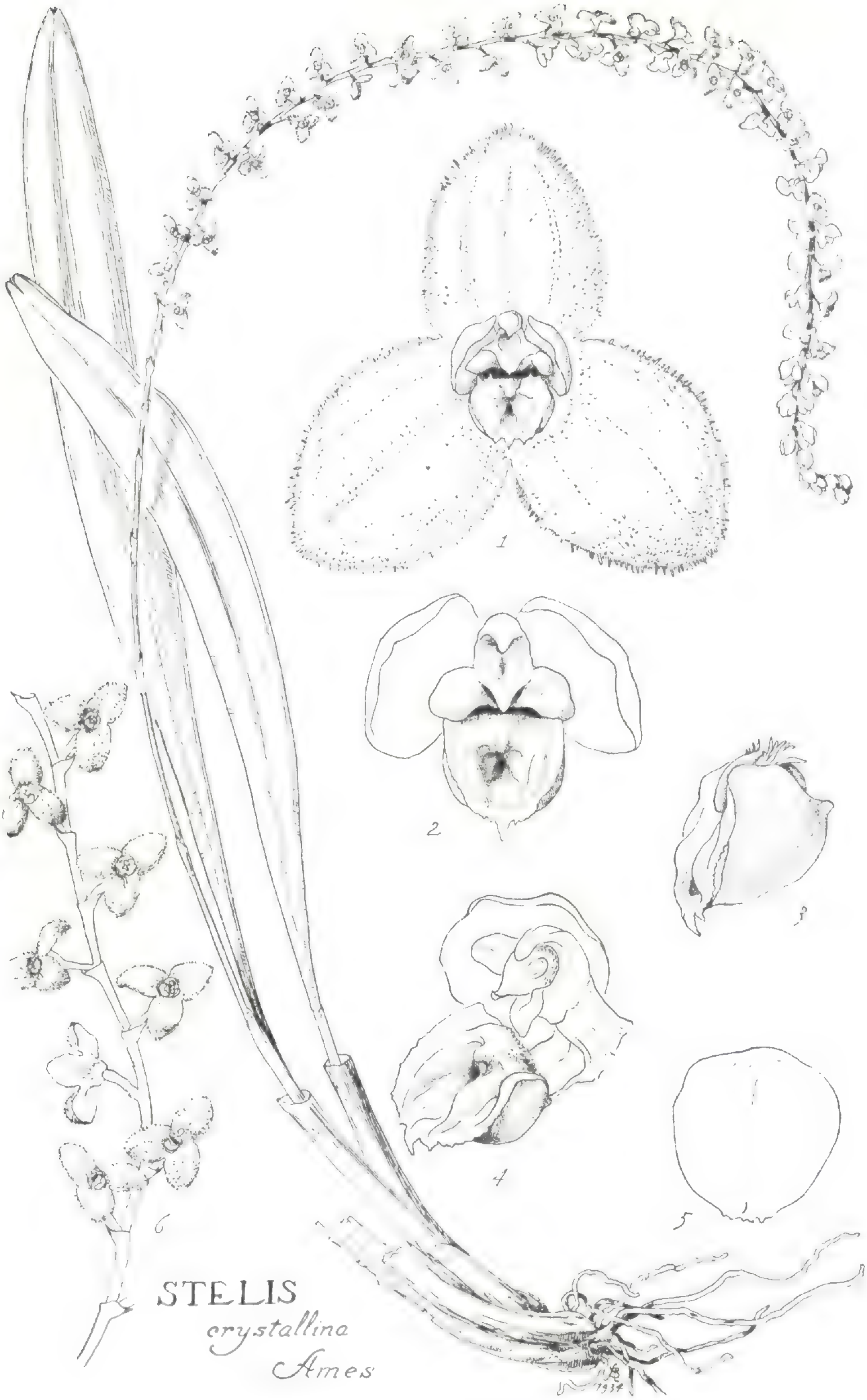
Caules secundarii dense caespitosi, erecti vel adscendentes, monophylli, vaginis tubularibus vestiti. Folium anguste oblongum, utrinque attenuatum, apice tridenticulatum. Racemus gracilis, folium excedens, multiflorus. Bracteae racemi infundibuliformes, acutae. Sepala valde convexa, elliptica, obtusa, trinervia, intus dense glandulosa, glandulis crystallinis obtecta. Petala suborbicularia, uninervia, apice vix incrassata. Labellum a latere visum semiglobosum, in circuitu orbiculare, valde incrassatum, apice denticulatum, basi callosum. Discus leviter furcato-carinatus, supra medium excavatus. Columna carnosa, petala aequans, antice utrinque lobo carnoso obtuso stigmatifero instructa, rostello late triangulo.

Leaf-bearing stems densely caespitose, up to 5 cm. long, unifoliate, clothed with several closely appressed tubular sheaths, the uppermost one 2.5 cm. long, 3 mm.

EXPLANATION OF ILLUSTRATION

STELIS CRYSTALLINA *Ames*. Plant natural size. 1, flower enlarged about nine times. 2, labellum, petals and column much enlarged, anther removed to reveal the stigmatiferous lobes of the column separated by the triangular rostellum. 3, labellum, much enlarged, side-view. 4, petal, labellum and column showing anther *in situ* with the stigmatiferous lobes extending on either side. 5, petal much enlarged. 6, a part of the raceme, slightly enlarged.

Drawn with the aid of the camera lucida, the analytical details having been drawn from material preserved in alcohol, by BLANCHE AMES.


1
2
3
4
5
6
STELIS
crystallina
Ames
1934

in diameter in dried specimens. Leaf about 12 cm. long, 1–1.7 cm. wide, oblong, tapering gradually from about the middle to the tridenticulate tip and to the slender petiole-like base, mid-nerve prominent beneath. Peduncle slender, up to 9 cm. long below the raceme, bearing several closely appressed tubular sheathing bracts and terminating in a slender many-flowered raceme. Raceme exceeding the leaves, about 12 cm. long. Bracts of the raceme infundibuliform, about 2 mm. long to the acute apex, about 3 mm. apart. Sepals fleshy, elliptical, obtuse, 3-nerved, about 3 mm. long, 2 mm. wide, strongly convex, densely covered on the inner surface with erect crystalline glands, united at base forming a shallow cup which is about 1 mm. deep, the lateral sepals somewhat larger than the dorsal sepal. Petals about 1 mm. long, about 1 mm. wide, suborbicular, slightly concave, hardly thickened at the apex, 1-nerved, usually equalling the column. Labellum about 1 mm. long, suborbicular, fleshy, semiglobose when viewed from the side, with the anterior margin minutely denticulate, the terminal tooth larger than the others and sharply deflexed; disc with a basal posteriorly glandulose rounded more or less porrect callus, thickened in front of the basal callus laterally to form a pair of carinae which extend almost to the apex of the labellum bounding a well-marked depression. Column about 1 mm. long, conspicuously trilobed at the dilated summit with the posterior lobe triangular-obtuse and sharply inflexed, and with the lateral lobes stigmatiferous, rounded and divaricate; rostellum broadly triangular, deflexed. Pollinia two, narrowly pyriform.

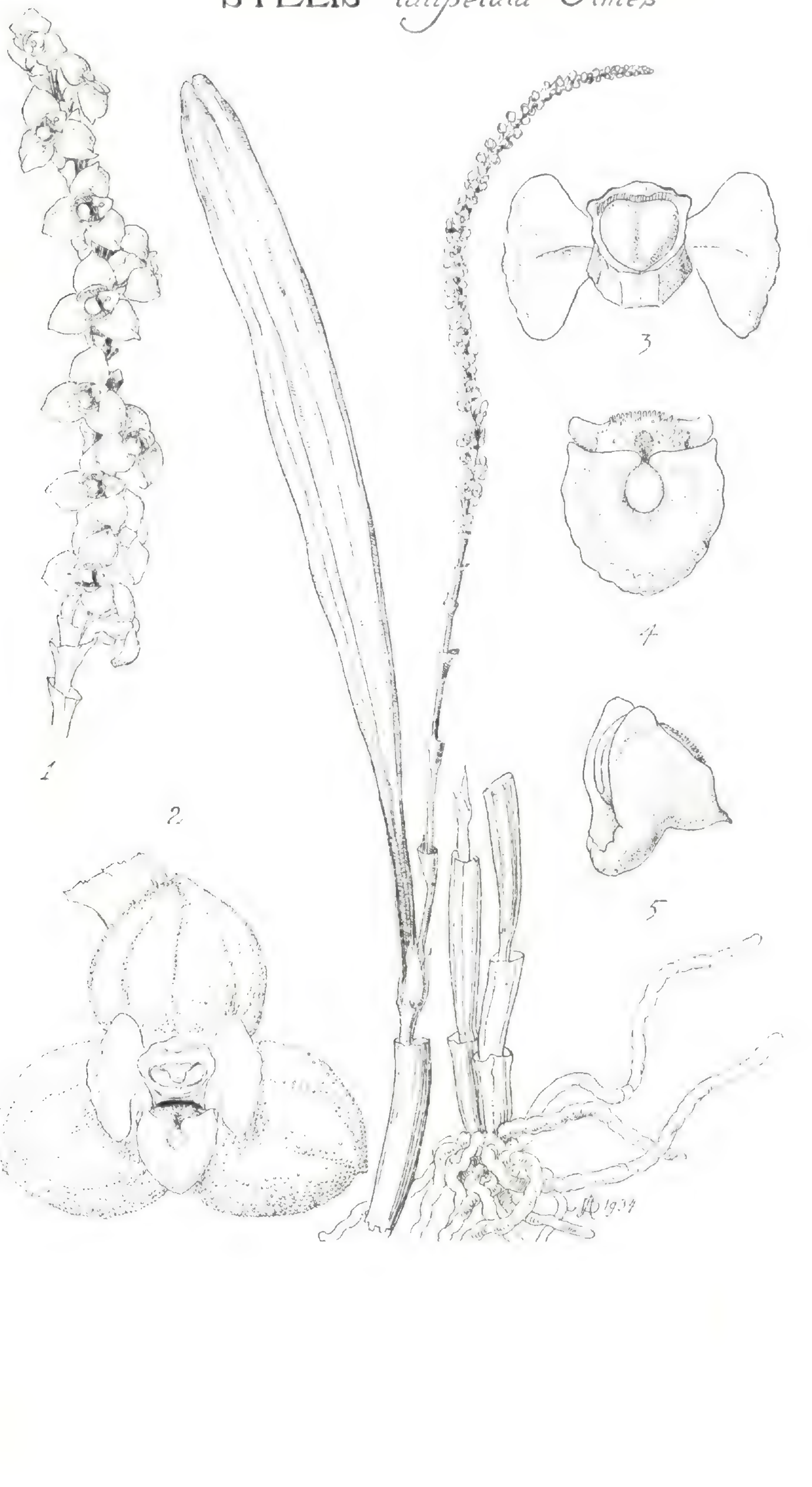
There are two sets of specimens of this species made by C. H. Lankester in 1925. No. 1010 from La Estrella de Cartago is characterized by having the petals orbicular and about equal to the column in length. No. 1051 from Cachi is characterized by elliptical-oblong petals that are

EXPLANATION OF ILLUSTRATION

STELIS LATIPETALA *Ames.* Plant natural size. 1, a part of the raceme much enlarged. 2, flower enlarged about sixteen times. 3, petals and column with the anther *in situ*, much enlarged. 4 & 5, labellum much enlarged. The circular area which appears to be a hole is made up of the paler tissues characteristic of the basal callus.

Drawn from dried specimens with the aid of the camera lucida by BLANCHE AMES

STELIS *latipetala Ames*



conspicuously longer than the column. Except for this difference the specimens of the two sets are similar and surely represent variants of a single species. A third set of specimens collected by A. M. Brenes at San Ramon agrees in detail with Lankester's 1010.

Costa Rica, La Estrella de Cartago. At 6,000 feet altitude. Flowers up to fifty; sepals frontally pale buffy vinaceous, white-hairy, externally flushed with dusky purple on the central vein and near the margin; petals, lip and column pale oil-green. July 24, 1925. *C.H. Lankester 1010* (Type in Herb. Ames No. 31194): Cachi. At 4,000 feet altitude. Flowers buffy. September 27, 1925. *C. H. Lankester 1051*: San Ramon. Epiphyte, 1.5–2.5 dm. tall. At 975 meters altitude. October 10, 1922. *A.M.Brenes (28) 323.*

Stelis latipetala *Ames sp. nov.*

Herba epiphytica. Caules monophylli, vaginis tubularibus vestiti. Folium coriaceum, ligulatum, apice bilobulatum. Racemi multiflori, erecti. Flores pusilli. Sepala orbiculari-ovata, trinervia, intus glanduloso-papillosa. Petala flabellata, uninervia. Labellum infra medium constrictum, superne plus minusve cordatum, callo glanduloso-papilloso prope basim instructum. Columna apice dilatata.

Epiphytic herb up to 2.1 dm. tall. Roots coarsely fibrous, about 2 mm. in diameter, whitish. Secondary stems caespitose, monophyllous, up to 7 cm. long, concealed by elongated tubular sheaths. Leaf 10–13.5 cm. long, up to 1 cm. wide in dried specimens (probably wider when alive), coriaceous, ligulate, bilobed at the apex. Peduncles 1 or 2, erect, with several infundibuliform bracts below the raceme, including the raceme 13–15 cm. long. Raceme about 7 cm. long, less than 3 mm. in diameter, bearing about seventy flowers. Sepals forming a tubular base; the lateral sepals about 1.5 mm. long, up to 2 mm. wide, orbicular-ovate, 3-nerved, minutely glandular-papillose on the inner surface. Dorsal sepal

similar. Petals 1 mm. long, 1.5 mm. wide, flabelliform, thickened at the broad apex along the margin, 1-nerved. Labellum 1 mm. long, 1 mm. wide, constricted below the middle, cordate, obtuse at the apex, with a pulvinate glandular-papillose callus below the middle. Column equalling the petals, lightly 3-lobed at the tip or almost entire, stigmas confluent on the anterior surface near the summit beneath the triangular rostellum. Pollinia two.

In the broad petals and in the structure of the column *Stelis latipetala* is closely allied to *S. crescentiicola* Schltr. but is much larger in all of its parts.

If the labellum is viewed directly from above, two rounded calli are discovered, one on each side of the disc, with their apices retrorse or convergent and almost contiguous. These calli are coalescent with the glandulose basal callus from which they are clearly differentiated by their deeper color. The basal callus becomes abruptly narrowed at its distal end and fills the space between the lateral calli forming with them a more or less well-defined transverse septum. This remarkable peculiarity characterizes several other species of the genus, but is by no means prevalent. That it is associated with the phenomena of pollination by insects seems highly probable. When this peculiarity is represented in a drawing there appears to be a circular hole at the centre of the disc, almost closed at the top. This is well shown in figure 4.

Costa Rica, Cachi. Flowers maroon, seventy or more in each raceme. September, 1925. *C. H. Lankester 1101* (Type in Herb. Ames No. 31109).

Stelis Storkii *Ames sp. nov.*

Radices fibratae, albidae, glabrae. Caules secundarii dense caespitosi, vaginis amplis obtecti, monophylli. Folia oblanceolata, bene marginata, coriacea, apice breviter apiculata, infra medium in petiolum sulcatum gracilem

angustata. Pedunculi filiformes, infra racemum pauci-bracteati. Racemi plus minusve novemflori, folium superantes. Bracteae inflorescentiae infundibuliformes. Sepala lateralia orbiculari-ovata, marginata, plus minusve carnosa, glabra, leviter concava. Sepalum dorsale simile. Petala cuneato-flabellata, leviter concava, apice leviter incrassata, per medium uninervia. Labellum cuneato-orbiculare, breviter unguiculatum, per medium callo ornatum. Columna brevis, apice trilobata, rostello linguiformi instructa.

A diminutive epiphyte with fibrous, whitish, smooth, spreading roots. Secondary stems monophyllous, densely caespitose, 1–1.5 cm. long, clothed with three or more elongated tubular sheaths of which the uppermost extends nearly to the axil of the leaf. Leaf 1–2 cm. long, 3–5 mm. wide, oblanceolate with a short apiculate apex, very fleshy, lightly triquetrous, narrowed from about the middle into a slender sulcate petiole. Peduncles one or two in the axil of the leaf, up to 3 cm. long including the raceme, emerging from a scarious conduplicate sheath, bearing about two tubular bracts below the lowermost flower. Raceme 1.5–2 cm. long, loosely flowered. Bracts of the raceme about 2 mm. apart, infundibuliform, 0.5 mm. long. Flowers smooth, yellowish. Lateral sepals 1 mm. long, about 1 mm. wide, orbicular-ovate, obtuse, rather fleshy, 1–3 nerved, with a keel on the mid-nerve on the outer surface. Dorsal sepal similar, usually 3-nerved. Petals about 0.75 mm. long, cuneate-flabellate, slightly concave, thickened toward the tip, 1-nerved. Labellum about 0.75 mm. long, 0.75 mm. wide, cuneate-orbicular or pentagonal, minutely auriculate at base, with a raised callus extending from the base beyond the centre of the disc. Column scarcely 1 mm. long, 3-lobed at the summit with the posterior lobe erect, rounded at the tip or paucidenticulate, in length equal to or longer than the

EXPLANATION OF ILLUSTRATION

STELIS STORKII *Ames.* Plant drawn natural size. 1, part of the raceme several times enlarged. 2, flower enlarged about 25 times. 3,column,much enlarged, showing stigmatiferous lobes, anther *in situ*, rostellum and posterior lobe. 4, petal enlarged about 17 times. 5, labellum enlarged about 15 times.

Drawn with the aid of the camera lucida from specimens preserved in alcohol by BLANCHE AMES

STELIS *Storkii Ames*

shaft of the column; stigmatiferous lobes porrect, deflexed, much reduced; rostellum linguiform, obtuse, longer than or equalling the stigmatiferous lobes. Pollinia two.

Stelis Storkii is closely allied to *S. tenuissima* Schltr., but differs from that species in habit and in the structure of the column. The sepaline nerves are variable in number. Usually there are three nerves in the dorsal sepal while only two occur in the lateral sepals. The callus is conspicuously raised above the floor of the disc and somewhat pandurate in outline; at the distal end it is bilobed or sulcate where it slopes obliquely toward the apex of the labellum.

Costa Rica, Santa Maria. May 15, 1928. *H.E.Stork 2103* (Type in Herb. Ames No. 40701): San Cristobal Road. At 8,000 feet altitude. Flowers yellowish green. May 27, 1928. *H.E.Stork 2226.*

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, FEBRUARY 5, 1935 VOL. 3, NO. 5

STUDIES IN EPIDENDRUM

BY

OAKES AMES, F. TRACY HUBBARD
AND CHARLES SCHWEINFURTH

DURING our studies of the North American species of Epidendrum, we have examined the material preserved in many of the large herbaria and have found several species and varieties which we find are undescribed. There are a few changes in rank or generic conception rendering new combinations necessary. Furthermore, due to the revision in the rules of nomenclature accepted at the Congress held in 1930, at Cambridge, England, the specific names of a number of species should be changed because of earlier use.

The purpose of this paper is to publish descriptions of the specimens we believe to be new and to make the necessary nomenclatorial changes.

Epidendrum adenocarpon *La Llave & Lex.* var. **Rosei** *Ames, Hubbard & Schweinfurth var. nov.*

A typo labelli lobis lateralibus ovato-triangularibus abbreviatis differt.

Lateral lobes of the lip abbreviated, obliquely triangular-ovate, rounded or subacute at the apex, anterior margin of the free portion about 1.6 mm. long, when expanded little exceeding the width of the mid-lobe.

The variety differs from the typical form chiefly in the shorter and differently shaped lateral lobes of the lip

which little exceed the width of the mid-lobe. Furthermore, the petals of the variety taper more gradually from their tip to their base and the mid-lobe of the lip is somewhat more elongate than in the typical form.

Mexico, State of Sonora, greenhouse grown specimen from plants collected in 1910 above Alamos. *J. N. Rose 10.1102 = 13062* (Type in Herb. Ames No. 38088. Duplicate type in U.S. Nat. Herb.); Alamos. July 1910. *J. N. Rose 10.1102 = 1614*: State of Tepic, Acaponeta. July 1897. *J. N. Rose 1533.*

The collection, *Rose 1533*, has lateral lobes of the lip which are intermediate between the species and the variety.

Epidendrum arbuscula *Lindl.* var. **radioferens** *Ames, Hubbard & Schweinfurth var. nov.*

A typo labello obscure lobato, laminae venis carinato-incrassatis differt.

Lip indistinctly 4-lobed, nearly orbicular in general outline, with the margin crenate-plicate and the radiating veins of the lamina strongly carinate-thickened; lateral lobes semiorbicular; mid-lobe orbicular-reniform, divided into two rounded lobules, separated from the lateral lobes by an indistinct sinus.

This variety differs from the typical form in having the lip less distinctly lobed and the radiating veins of the lamina carinate-thickened.

The Heyde and Lux specimen cited approaches the typical form in having a sharp sinus and less crenate-plicate margins.

Mexico, State of Chiapas, "Terre Froide Fleurs rouges foncé Fleurit en Mars Croit sur les rochers et les chênes Plante de 2 à 3 pieds de hauteur" 1864-70. *Ghiesbreght 907* (Type in Herb. Gray.)

Guatemala, *Heyde & Lux* (Donn.-Sm.) *3509* (U.S. Nat. Herb. No. 826142.)

Epidendrum atropurpureum *Willd.* var. **laciniatum** *Ames, Hubbard & Schweinfurth var. nov.*

A typo labelli lobi medii marginibus irregulariter laciniatis et basi longe cuneata differt.

Lateral lobes of the lip small, variable in shape, not arching over the column as in the typical form, outer margins sparsely sinuate-dentate, anterior margin of free portion 4.9–6 mm. long; mid-lobe obovate in outline from a long-cuneate base, about 3 cm. long, 2.45 cm. wide just above the middle, apex truncate-retuse, margins above the cuneate portion irregularly dentate-laciniate.

The variety is readily separable from the typical form in the irregularly dentate-laciniate margins and the long-cuneate base of the mid-lobe of lip.

Panama, foothills east of city. "Sepals and petals are the same as Epid. atropurpureum, lip is a pink with dentate or notched margin, the lateral lobes are very small and do not meet over the column. color rose pink." At sea-level. *C. W. Powell 287* (Type in Herb. Ames No. 25017.)

Epidendrum bractescens *Lindley* in Bot. Reg. 26 (1840) Misc. p. 58.

Epidendrum aciculare Bateman apud Lindley in Bot. Reg. 27 (1841) Misc. p. 46.

Epidendrum linearifolium Hooker in Bot. Mag. 77 (1851) t. 4572.

Epidendrum esculentum Hort. Kew. in Herb. Hooker ex Lindley Fol. Orch. Epid. (1853) p. 15, *in synon.*

Encyclia acicularis Schlechter Orchideen (1914) 207.

The earliest name for the species usually known as *Epidendrum aciculare* is *E. bractescens.* This name has not been accepted in the past, although as far back as 1861 Reichenbach (in Walp. Ann. 6 (1861) 333) reduced it to synonymy under *E. aciculare,*– because the plant typifying the species is abnormal. The abnormality (as

shown by a photograph of the type sheet) is the result of the foliaceous development of the lowermost bracts of the inflorescence. While it is unfortunate to be obliged to replace a well-known specific name by an older one based upon an abnormal specimen, there seems to be no valid reason for rejecting the earlier name.

There is little doubt but that the two concepts, as Reichenbach asserted, are the same. Aside from the foliaceous bracts of the inflorescence there is no substantial difference between the original descriptions of *E. bractescens* and *E. aciculare*. In 1922, the type sheet of *E. bractescens* Lindl. in the Lindley Herbarium was examined and photographed (by Ames) and the following comment noted: "E. bractescens is an abnormal form of E. aciculare..."

Epidendrum costatum *A. Richard & Galeotti* in Comptes Rend. Acad. Sci. Par. 18 (1844) 510, 512, *nomen*; in Ann. Sci. Nat. ser. 3, 3 (1845) 21.

The inadequate original description reads: Caule compresso; fol. elliptico-oblongis obtusis; flor. purpureis; racemo terminali: labello adnato orbiculari basi cordato crasso, costis divergentibus notato."

The type of the species is in Paris and the photograph of it is not of great diagnostic value. There is, however, a colored drawing of the plant with an enlarged drawing of a single flower in the Reichenbachian Herbarium at Vienna. This drawing, which came from the Richard Herbarium, represents the type and is the only reliable guide we have to the identity of the species.

In studying the Epidendrum material of the Gray Herbarium, we found two specimens collected by C.G. Pringle at Sierra de San Felipe, Oaxaca, Mexico (*Pringle 5888 & 5889*). These had been determined as *E. lamprocaulon* Reichb.f., but were unquestionably not referable

to that species. After critical examination of the flowers of the two specimens, we were led to believe that they are referable to *E. costatum* A. Rich. & Gal. and on this assumption an amplified description of the species based upon these specimens is given below.

Another specimen from the same locality, in the collection of Erik M. Östlund, has been examined in the preparation of the amplified description.

Plant often caespitose, up to 26 cm. and more tall (largest plant incomplete). Roots stout for the plant, numerous, fibrous, flexuous, longitudinally sulcate when dry. Stem stout or slender, up to 8 mm. in diameter, entirely concealed by sheaths which are deciduous below rendering the lower portion of the stem naked, more slender at the base. Leaves distichous, linear-elliptic to oblong-elliptic, up to 10 cm. or perhaps more long, 7–16.5 mm. wide, obtuse to acute, sometimes recurved and conduplicate, coriaceous. Inflorescence sessile, racemose to densely and shortly paniculate, few- to many-flowered. Lateral sepals fleshy, more or less carinate on the outer surface, broadly elliptic to rounded-oval, slightly oblique, 7.8–11.2 mm. long, 5–5.5 mm. wide, acute to obtuse, margins of the upper part somewhat involute. Dorsal sepal oblanceolate or narrowly obovate, 9–12 mm. long, 4.5–5.2 mm. wide, acute to obtuse, more or less thickened at the apex, sometimes cucullate. Petals spatulate to oblanceolate, 9–12.1 mm. long, 2.9–4.9 mm. wide, rounded to subacute, 3-nerved. Lip simple to weakly 3-lobed, suborbicular-reniform to orbicular, distinctly retuse or bilobed at apex, base strongly cordate, claw entirely adnate to the column; lamina 10.5–14 mm. long (extreme over-all measurements), 13.5–15 mm. wide, margins erose to subcrenulate and often rather plicate toward the apex; disc with fleshy radiating keels above the nerves, the three middle parallel ones most prominent, biallose at the base.

Column 5.4–7 mm. long, much dilated above and very oblique at base, often extended at the apex on each side into a rounded-triangular lobule.

Mexico, State of Oaxaca, Cordillera. "Sans Bulbes. Fl. Violet fonces, labelle très charnu, cotété lilas – chênes à 4500-7500." September to November 1840. *H. Galeotti 5035* (Type in Herb. Mus. Par.); Sierra de San Felipe. On oaks. At 8,000 feet altitude. June 20, 1894. *C. G. Pringle 5888* (Herb. Gray); Sierra de San Felipe. On oaks. At 7,500 feet altitude. November 19, 1894. *C. G. Pringle 5889* (Herb. Gray); Mt. San Felipe. *Erik M. Östlund 2949* (Collector J. Richard).

Epidendrum crassilabium *Poeppig & Endlicher* Nov. Gen. ac Sp. 2 (1838) 1, t. 102.

Epidendrum variegatum Hooker in Bot. Mag. 59 (1832) t. 3151, nec Swartz (1788), nec Koenig in Retzius (1791).

Epidendrum coriaceum Parker apud Hooker in Bot. Mag. 64 (1837) t. 3595, non Poiret (1810).

Epidendrum pamplonense Reichenbach filius in Linnaea 22 (1849) 837.

Epidendrum variegatum Hook. var. *virens* Lindley Fol. Orch. Epid. (1853) p. 38.

Epidendrum variegatum Hook. var. *coriaceum* Lindley Fol. Orch. Epid. (1853) p. 38.

Epidendrum variegatum Hook. var. *crassilabium* Lindley Fol. Orch. Epid. (1853) p. 38.

Epidendrum variegatum Hook. var. *leopardinum* Lindley Fol. Orch. Epid. (1853) p. 38.

Epidendrum coriaceum Focke in Bot. Zeit. 11 (1853) 228, nec Poiret (1810), nec Parker apud Hooker (1837).

Epidendrum pachysepalum Klotzsch in Allg. Gartenz. 23 (1855) 274 (fide Veitch and Cogniaux).

Epidendrum variegatum Hook. var. *lineatum* Reichenbach filius in Bonpl. 4 (1856) 326.

Epidendrum pachycephalum Veitch Man. Orch. Pl. pt. 6 (1890) 123, in synon., *sphalm.*
Aulizeum variegatum Stein Orchideenb. (1892) 241, in synon.
Epidendrum baculibulbum Schlechter in Fedde Repert. Beihefte 19 (1923) 116, 209.

The earliest specific name of this species, *Epidendrum variegatum* Hook., is not tenable on account of the earlier use of the combination by Swartz in 1788 and by Koenig in 1791. The next name chronologically is *E. coriaceum* Parker apud Hooker, but this again is antedated by the combination *E. coriaceum* Poiret made in 1810. The third name applied to this species was *E. crassilabium* Poepp. & Endl. and this name, being the valid one, should replace Hooker's *E. variegatum.*

Epidendrum curvicolumna *Ames, Hubbard & Schweinfurth sp. nov.*

Herba caespitosa. Caules flexuosi. Folia disticha, elliptica vel elliptico-oblonga, apice oblique bilobata. Inflorescentiae subumbellatae, pauciflorae. Sepala lateralia elliptica, acuta. Sepalum dorsale simile, concavum. Petala anguste oblanceolata vel lineari-oblanceolata, basi curvata. Labellum columnae omnino adnatum; lamina in circuitu reniformis, trilobata; lobi laterales rotundati; lobus terminalis multo minor, subquadratus, leviter retusus. Columna valde arcuata.

Plant caespitose, about 21 cm. high. Stems flexuous, mostly concealed by leaf-sheaths, up to 19 cm. long. Leaves distichous, elliptic to elliptic-oblong, 2.2–4.5 cm. long, 8–14 mm. wide, obtuse at apex with very oblique lobules, coriaceous. Inflorescence subumbellate, in our specimen each abbreviated rachis apparently 2- to 4-flowered. Floral bracts broadly ovate, deeply concave, acute, amplexicaul. Flowers small, green. Lateral sepals elliptic,

8.1–9 mm. long, 4–4.3 mm. wide, acute, carinate-thickened at the apex, indistinctly 5-nerved. Dorsal sepal lanceolate-elliptic, 9–9.2 mm. long, about 3.5 mm. wide, concave, subacute to acute, indistinctly 5-nerved. Petals narrowly- to linear-oblanceolate, curved at the base, about 9 mm. long, 1.9–2.2 mm. wide above the middle, 3-nerved, subacute to acute. Lip adnate to the column to its tip, 3-lobed; lamina reniform in outline, about 4 mm. long, 8.5–9 mm. wide; lateral lobes auriculate-suborbicular, separated from the mid-lobe by a usually obtuse sinus; mid-lobe much smaller, subquadrate, slightly retuse at the apex; disc minutely bicallose at base. Column abruptly arcuate when viewed from the side, about 7 mm. long from the posterior portion of the base to the apex of the clinandrium, dilated at both ends; clinandrium petaloid and denticulate.

A member of the *E. difforme* group. Its nearest ally seems to be *E. pudicum* Ames from which it is easily separable by its broad flat leaves.

PANAMA, Chiriqui Province, "Lino Hill." At 4,000-4,500 feet altitude. "Grows in exposed places in considerable sun. Flowers green Flowers May-July" *C. W. Powell 296* (TYPE in Herb. Ames No. 26885. DUPLICATE TYPE in Herb. Mo. Bot. Gard. No. 956083.)

Epidendrum Deamii *Schlechter* in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 402.

Epidendrum tessellatum Bateman apud Lindley in Bot. Reg. 24 (1838) Misc. p. 7, non Roxb. (1795).

Encyclia tessallata Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 474.

Due to the earlier use of the combination *E. tessellatum* by Roxburgh, we are obliged to accept *E. Deamii* Schltr. as the valid name of this species in place of *E. tessellatum* Batem.

Epidendrum dentilobum *Ames, Hubbard & Schweinfurth sp. nov.*

Herba caespitosa. Radices crassae. Caules graciles, superne foliosi. Folia oblongo-elliptica, acuta. Inflorescentiae recurvae, breviter paniculatae. Flores rari, pauci, carnosi. Sepala lateralia oblique ovato-elliptica, acuta. Sepalum dorsale oblongo-ellipticum, valde concavum. Petala spathulato-oblanceolata, leviter obliqua. Labellum columnae valde adnatum; lamina trilobata; lobi laterales minuti, anguste triangulares, patentes; lobus medius semiorbiculari-flabellatus, late rotundatus; discus basi callo trilobato ornatus. Columna crassa, antice concava.

Plant caespitose, about 30 cm. high. Roots very stout in relation to the plant, fibrous, simple, somewhat flattened, about 4 mm. in diameter. Stems slender, entirely concealed by tubular sheaths, leaf-bearing above the middle. Leaves four to five, distichous, oblong-elliptic, 6.3–10 cm. long, 1.3–1.85 cm. wide, becoming smaller toward base of stem, acute, complicate-mucronate at apex, subcoriaceous. Inflorescence recurved, shortly paniculate with two or three branches. Bracts of the inflorescence scarious, concave, acute to acuminate. Flowers remote, apparently few. Lateral sepals obliquely ovate-elliptic, 11 mm. long, about 6.1 mm. wide near the middle, acute, somewhat carinate in the upper portion, slightly concave, 5- to 7-nerved. Dorsal sepal oblong-elliptic, about 12 mm. long, 5.5 mm. wide, strongly concave, 5-nerved, subacute with a cucullate tip. Petals spatulate-oblanceolate, about 11 mm. long, 6 mm. wide toward the apex, obtuse to broadly rounded, 3-nerved. Lip strongly adherent to the column; lamina 3-lobed, 6.5 mm. long, 8 mm. broad across the anterior portion; lateral lobes small, narrowly triangular from a broad decurrent base, spreading, free portion about 1.3 mm. long;

mid-lobe much larger, semicircular-flabellate, very broadly rounded, abruptly narrowed at base to form a well-marked sinus, 3-nerved with the mid-nerve fleshy-thickened; disc provided at the base with a fleshy 3-lobed callus of which the middle lobe is raised into a horn. Column short, stout, anterior surface concave, about 7 mm. long on the posterior surface; clinandrium with a broad fleshy incurved tooth in the centre.

Epidendrum dentilobum is without any near allies, though habitally it somewhat suggests *E.centradenia* Reichb.f.

PANAMA, range of hills back of San Juan, upper reaches of the Chagres River. About sea-level. Sepals and petals pale yellowish green, with purple "latitudinal" blotches. Lip white, with a blood-red dot on each side of the median line. Late September. *C. W. Powell 342* (TYPE in Herb. Ames No. 27145.)

Epidendrum eustirum *Ames, Hubbard & Schweinfurth nom. nov.*

Epidendrum carinatum Lindley Fol. Orch. Epid. (1853) p. 61, nec Linnaeus (1753), nec Vahl (1793).

Owing to the former use of *carinatum* as a specific name, *E.carinatum* Lindl. requires a new name.

The new specific name *eustirum* means well-keeled, in reference to the carinate sepals.

Epidendrum glaucovirens *Ames, Hubbard & Schweinfurth nom. nov.*

Prosthechea glauca Knowles & Westcott Floral Cab. 2 (1838) 111.

Epithecia glauca Knowles & Westcott Floral Cab. 2 (1838) 167, t. 87.

Epidendrum glaucum Lindley in Bot. Reg. 26 (1840) Misc. p. 29, non Swartz (1788).

The specific combination *E.glaucum* Lindl. is invalidated because of the earlier *E.glaucum* of Swartz.

In the absence of synonyms, a new name is necessary for Lindley's species.

Epidendrum incomptoides *Ames, Hubbard & Schweinfurth sp. nov.*

Herba epiphytica, fruticosa, lignosa. Rami numerosi, superne foliosi. Folia elliptica vel oblongo-elliptica, acuta. Inflorescentiae racemosae, terminales, erectae vel recurvae. Bracteae patentes. Flores longipedicellati. Sepala lateralia oblique oblongo-obovata, acuta vel acuminata. Sepalum dorsale oblongo-oblanceolatum, acutum vel breviter acuminatum. Petala lineari-oblanceolata. Labellum columnae adnatum; lamina in circuitu reniformis, antice trilobata, basi cordata; lobi laterales transverse ovales; lobus medius multo minor, transverse semiovalis vel semiorbicularis, acutus. Columna leviter arcuata, superne dilatata.

Plant much branched (specimens examined consist only of the upper portions of the plant), woody. Stems longitudinally striate-sulcate, gray, approximately 2–3.5 mm. in diameter, naked on the lower portions of which the somewhat swollen nodes were at one time leaf-bearing; upper portions of stem copiously forked, with short branches which are arcuate-ascending and provided with one or two short infundibuliform sheaths below and four to five leaves above. Leaves elliptic to elliptic-oblong, 3.8–5.5 cm. long, 8–13 mm. wide, acute (sometimes appearing acuminate) at the complicate apex, sessile at the cuneate base, subcoriaceous. Inflorescences racemose, solitary at the end of the branches, erect or slightly recurved, up to 3.2 cm. long including the peduncle; peduncle ancipitous, up to 1 cm. long; rachis stout, subfractiflex, 6- to 8-flowered. Floral bracts spreading, ovate-triangular, acuminate, amplexicaul, concave, up to 5 mm. long. Flower long-pedicellate. Lateral sepals

obliquely oblong- or ovate-oblanceolate, about 12 14 mm. long, about 4.5 mm. wide, acute to acuminate, carinate at the tip on the outer surface, 5-nerved. Dorsal sepal oblong-oblanceolate, 11.2–12.2 mm. long, about 4 mm. wide, acute to short-acuminate, more or less carinate at the tip on the outer surface, 5-nerved. Petals linear-spatulate, slightly oblique, about 11.2 mm. long, about 1.4–1.9 mm. wide at the broadest part, subacute to acute, 1-nerved. Lip with a long claw, adnate to the column for the entire length of the column; lamina reniform in outline, deeply cordate at base, 3-lobed in front, about 6 mm. long, about 12.5 mm. broad; lateral lobes transversely oval, much larger than the mid-lobe, separated from the mid-lobe by a sharp narrow sinus; mid-lobe transversely semioval to semiorbicular, abruptly acute or apiculate, scarcely exceeding the forward rounded margin of the lateral lobes; disc biallose at base with three parallel fleshy evanescent lines. Column trumpet-shaped, slightly arcuate, about 8 mm. long.

Epidendrum incomptoides is a very close ally of *E. incomptum* Reichb. f., but differs from it in having smaller leaves and a dissimilar lip. In its habit of branching it suggests *E. ledifolium* A. Rich. & Gal. and *E. propinquum* A. Rich. & Gal., but florally it is very different.

MEXICO, "Mts. near Fenia." On oak. May. *C. A. Purpus 299* (TYPE in U. S. Nat. Herb. No. 1319026. DUPLICATE TYPE in Herb. Ames No. 30476.)

Epidendrum maculosum *Ames, Hubbard & Schweinfurth nom. nov.*

Epidendrum guttatum A. Richard & Galeotti in Comptes Rend. Acad. Sci. Par. 18 (1844) 509, 510, 512, *nomen;* in Ann. Sci. Nat. ser. 3, 3 (1845) 20, non L. (1753).

Encyclia guttata Schlechter in Beihefte Bot. Cen-

tralbl. 36, Abt. 2 (1918) 472.

On account of the earlier application of the specific name *guttatum*, a new name must be given to the *E. guttatum* of Richard & Galeotti.

Epidendrum obliquifolium *Ames, Hubbard & Schweinfurth sp. nov.*

Herba copiose ramosa, parva. Caules graciles, vaginis laxis infundibuliformibus maxima pro parte obtecti. Folia disticha, parva, obliqua, ovato-elliptica, crasse coriacea. Inflorescentiae perbreves, subumbellatae, pauciflorae, pedunculo spatha laxissime infundibuliformi ornato. Sepala lateralia ovato-lanceolata, acuta. Sepalum dorsale ovato-oblongum, acutum. Petala linearia, obtusa. Labellum columnae adnatum; lamina subrectangulo-oblonga, leviter bilobata, marginibus erosis; discus callis binis approximatis basi ornatus et lineis medianis tribus percursus. Columna crassa, perbrevis. Ovarium vesicula in summitate ornatum.

Plant much branched, herbaceous, up to 15 cm. tall. Roots fibrous, filiform. Stems rather slender, mostly concealed by loose infundibuliform sheaths which are dilated above and somewhat striate-rugose. Leaves distichous, obliquely ovate-elliptic, up to 4 cm. long and 11 mm. broad, acute, coriaceous when dry (apparently fleshy when living). Inflorescence short, subumbellate, about 3- or 5-flowered; peduncle below the inflorescence up to 1.5 cm. long, mostly concealed by a very loose conspicuous infundibuliform purple-blotched conduplicate spathe. Floral bracts minute and inconspicuous. Lateral sepals ovate-lanceolate, oblique at the base, about 8 mm. long and 4 mm. wide, acute. Dorsal sepal ovate-oblong, concave, about 7.1 mm. long and 3.6 mm. wide, acute. Petals linear, about 6.9 mm. long and 1.5 mm. wide, obtuse, prominently 1-nerved. Lip simple, adnate to the

column, subrectangular-oblong, retuse or shallowly bilobed at apex, rounded at base, about 7 mm. long, 4.2–4.9 mm. wide, margin strongly erose; disc bicallose at base, traversed by three central parallel thickened nerves. Column very short, stout, about 3.6 mm. long. Ovary with a saccate vesicle at its very summit.

Epidendrum obliquifolium has no near allies among the Central American species. The general aspect of the plant suggests *E. Peperomia* Reichb.f., a South American species.

The specimen described is in young fruit and consequently the flowers are beyond their prime and difficult to interpret accurately. The species, however, is so distinct that it seems wise to describe it.

Costa Rica, "Hda. La Esperanza (La Palma)." At 1,500 meters altitude. December 1913. *Otón Jiménez 972* (Type in U. S. Nat. Herb. No. 1229729.); Santa Clara de Cartago. Suspended on mossy tree trunks. At 7,000 feet altitude. December 23, 1923. *C. H. Lankester 566*; Province of Cartago, Alto de La Estrella. On tree. March 26, 27, 1924. *Paul C. Standley 39572* and *39578* (both in fruit).

Epidendrum Parkinsonianum *Hook.* var. **falcatum** (*Lindl.*) *Ames, Hubbard & Schweinfurth comb. nov.*

Epidendrum falcatum Lindley in Ann. Nat. Hist. 4 (1840) 382.

Epidendrum lactiflorum A. Richard & Galeotti in Comptes Rend. Acad. Sci. Par. 18 (1844) 506, 512, *nomen*; in Ann. Sci. Nat. ser. 3, 3 (1845) 22.

Epidendrum falcatum Lindl. var. *Zeledoniae* Schlechter in Fedde Repert. Beihefte 19 (1923) 37, 212.

Certainly this variety is not specifically distinct from *E. Parkinsonianum*. Its claim to varietal distinction is based on its smaller flowers. In the typical form the lip from the base of the column to the tip of the mid-lobe is 5.5–8 cm. long (usually 6.5–8 cm.), the sepals are 5.6–8

cm. long and the petals 5.5 cm. or more long. In the variety the lip is 3.5–4 cm. long, the sepals are 3.5–4 cm. long and the petals about 3.25 cm. long.

Epidendrum polyanthum *Lindl.* var. **myodes** (*Reichb.f.*) *Ames, Hubbard & Schweinfurth comb. nov.*

Epidendrum myodes Reichenbach filius Beitr. Orch. Centr.-Am. (1866) 86.

The variety of this very variable species differs from the typical form chiefly in the size of the flowers. In the typical form the lateral sepals are 7–16 mm. long; in the variety they are 4.5–6 mm. long.

Epidendrum purpurascens *Focke* in Tijdschr. Nat. Wetensch. 4 (1851) 64.

Epidendrum clavatum Lindley in Bot. Reg. 22 (1836) t. 1870, non Koenig (1791).

Didothion clavatum Rafinesque Fl. Tellur. 4 (1838) 39.

Epidendrum glumibracteatum Reichenbach filius in Hamb. Gartenz. 19 (1863) 11.

Epidendrum clavatum Lindl. var. *purpurascens* Cogniaux in Martius Fl. Bras. 3, pt. 5 (1898) 73.

On account of the earlier use of the specific name *clavatum*, Lindley's combination should be replaced by *E. purpurascens* Focke which a careful comparison of the original description with the material and plate of *E. clavatum* has convinced us is conspecific.

Epidendrum Tuerckheimii (*Schltr.*) *Ames, Hubbard & Schweinfurth comb. nov.*

Encyclia Tuerckheimii Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 410.

This species has not previously been transferred to Epidendrum.

Epidendrum virgatum *Lindley* in Hook. Journ. Bot. 3 (1841) 83.

The combination *E. virgatum* was made by Velloso (Flora Fluminensis 9 (1827) t. 40) and would seem to invalidate the *E. virgatum* of Lindley, but this is not the case because Velloso's plate in Flora Fluminensis is without analytical diagrams and no description of Velloso's species was published prior to 1881.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, FEBRUARY 19, 1935 VOL. 3, NO. 6

ADDITIONS TO THE ORCHID FLORA OF BRITISH GUIANA

BY

CHARLES SCHWEINFURTH

THE FOLLOWING CONTRIBUTION to our knowledge of the orchids of British Guiana consists of ten apparently undescribed members of the Pleurothallideae viz.: one species of Stelis, four species of Pleurothallis and five species of Octomeria. The collectors represented are E. F. im Thurn, G. Jenman and N. Y. Sandwith. In general the descriptions are based on herbarium specimens, but in a few cases these were supplemented by water-color drawings. For the opportunity to describe these species, we are indebted to the Royal Botanic Gardens at Kew and to the New York Botanical Garden and extend our thanks to them for the loan of the material upon which the descriptions were based.

Stelis perparva *C. Schweinfurth sp. nov.*

Herba perparva, caespitosa, epiphytica. Radices fibrosae, glabrae. Caules brevissimi, unifoliati. Folium obovato-ellipticum vel cuneato-spathulatum. Inflorescentia folia multo superans; pedunculus filiformis. Racemus pluriflorus. Flores carnosi. Sepala intus minute papillosa. Sepala lateralia per dimidium inferius connata, parte libera oblique rotundato-ovata. Sepalum dorsale majus, acutum. Petala minuta, late cuneata, apice truncata. Labellum minutum, subrotundato-flabellatum.

Plant very small, epiphytic, caespitose, up to 5 cm. high to the tip of the raceme. Roots fibrous, glabrous. Stems very short, about 1–2 mm. long, monophyllous, 1-jointed, entirely concealed by two or three tubular imbricating scarious evanescent sheaths. Leaf obovate-elliptic, cuneate-spatulate or oblanceolate, rounded or subacute at the apex, narrowed toward the base, up to 15 mm. long and 6 mm. wide, coriaceous, apparently very fleshy in the fresh condition. Inflorescence usually solitary, two or three times surpassing the leaf. Peduncle up to the raceme filiform, about 2.3 cm. long, provided with two remote inconspicuous tubular sheaths. Raceme distichous or secund, about 5- to 11-flowered, up to 1.8 cm. long, erect or arcuate. Flowers minute, fleshy, pale greenish yellow, anther bright yellow. Sepals minutely and finely papillose on the inner surface. Lateral sepals connate to about the middle, about 1 mm. long, 1-nerved; free portion asymmetrically round-ovate, acute (the collector's notes say very obtuse and convex). Dorsal sepal much larger than the lateral sepals, sharply acute, 3-nerved, about 1.5 mm. long, connate with the lateral sepals below; free portion ovate, about 1 mm. wide. Petals minute, broadly cuneate, about 0.6 mm. long and subequally wide at the truncate apex, 1-nerved, finely pubescent on the apical margin. Lip minute, subrotund-flabellate, about 0.5 mm. long and 0.7 mm. wide, broadly rounded above, apparently thickened along the apical margin and in the centre. Column minute, subglobose.

A separate collection (*im Thurn 154bis*) shows a leaf 16.5 mm. long and a short 3-flowered inflorescence.

Stelis perparva simulates *S.guianensis* Rolfe vegetatively, but has smaller differently proportioned sepals.

British Guiana, behind Manager's House, Arakaka (Barima River). "..., which grows, not uncommonly, on the exposed ends of the twigs of small trees or large shrubs... Pollinia two, pear-shaped,

and without caudicle." April [?] 1896. *E.F. im Thurn 154* (Type in Herb. Kew.); *im Thurn 154 bis*; "white". *im Thurn s.n.* (All in Herb. Kew.)

Pleurothallis breviscapa *C. Schweinfurth sp. nov.*

Herba parva, caespitosa. Radices fibrosae, crassae. Caules perbreves, unifoliati. Folium anguste ellipticum vel obovato-oblongum, valde coriaceum. Scapi tenues, quam folium multo breviores, uni- vel biflori. Sepala lateralia libera, anguste lanceolata, falcata. Sepalum dorsale lanceolato-oblongum vel elliptico-lanceolatum. Petala multo breviora, minute ciliolata. Labellum oblanceolatum, acutum, prope basim lobulis dentiformibus praeditum.

Plant small, caespitose, epiphytic, about 3–4 cm. high. Roots fibrous, glabrous, numerous. Stems very short, monophyllous, about 4.5–9 mm. long, concealed by two tubular imbricating evanescent sheaths, more or less decumbent at base, erect or spreading. Leaf narrowly obovate-oblong or narrowly elliptic, acute or subacute, gradually narrowed to a scarcely petioled base, about 2.5–3.3 cm. long, 6–7 mm. wide, very coriaceous, erect, the mid-nerve sulcate above and prominent beneath. Inflorescences one to four, about half as long as the leaf, 1- or 2-flowered. Peduncle up to the lowest flower filiform, about 2 cm. long, apparently finely pubescent. Flowers large for the plant. Lateral sepals free, narrowly lanceolate, falcate, about 6.2 mm. long and 1.2 mm. wide, acute or acuminate, 3-nerved. Dorsal sepal narrowly lanceolate-oblong to elliptic-lanceolate, about 6.3 mm. long and 1 mm. wide, acute, 3-nerved. Petals half as long as the sepals, oblong or elliptic-lanceolate, shortly acuminate, about 3.1 mm. long and 1 mm. wide, 1-nerved, finely cellular-ciliate except near the base. Lip oblanceolate, acute, about 5 mm. long including the small linear claw, 1.2 mm. wide, with two oblong auricles at base parallel

to the claw and with a pair of small spreading triangular-dentiform lobules near the base, finely cellular-ciliate on the margin, 3-nerved with the lateral nerves extending only to the middle. Column short, provided with a membranaceous wing which is dilated at base, rather abruptly dilated above the middle and tridentate at the apex, about 2 mm. long on the dorsal surface.

Pleurothallis breviscapa is apparently allied to *P. funerea* Cogn., but differs in the smaller leaf, pubescent pedunceles, 1- or 2-flowered inflorescence, ciliolate petals and the presence of basal auricles on the lip. A drawing of this number shows thick leaves and wine-red flowers.

British Guiana, June 1897. *E. F. im Thurn 181* (Type in Herb. Kew.)

Pleurothallis diffusiflora *C. Schweinfurth sp. nov.*

Herba epiphytica, caespitosa. Caules perbreves, monophylli, vaginis tubularibus imbricatis omnino tecti. Folium obovato-spathulatum, apice rotundatum, inferne attenuatum. Inflorescentiae folium multo superantes, diffusae. Racemi valde fractiflexi, laxi. Pedicelli longi. Sepala lateralia fere omnino connata; lamina elliptica, concava. Sepalum dorsale simile. Petala multo minora, late spathulata, apiculata. Labellum ovatum, parte apicali subgloboso-incrassata. Columna gracilis.

Plant caespitose, middle-sized, about 13.6 cm. high. Roots fibrous, glabrous, numerous. Stems very short, unifoliate, about 10–14 mm. long, entirely concealed by two (or rarely three) tubular scarious imbricating evanescent sheaths of which the upper is much the longer. Leaf obovate-spatulate, gradually tapering to a sessile or shortly petioled base; blade about 3–3.6 cm. long and 12–13 mm. wide, broadly rounded above, often with a minute acute tip, marginate, coriaceous; petiole indistinct, up

to 4 mm. long. Inflorescences one to four, arising from the stem a little below the terminal leaf, several times longer than the leaf; peduncle up to the raceme filiform, 3.5–4.5 cm. long, provided below the middle with an inconspicuous close tubular sheath. Raceme loose, flexuous or diffuse, 6- to 19-flowered; rachis strongly fractiflex. Pedicels long, arcuate, 11 mm. or less long. Flowers membranaceous. Lateral sepals connate forming an elliptical concave lamina which is minutely emarginate at the apex, about 5 mm. long and 3 mm. wide, 6-nerved, making with the column-foot a small mentum. Dorsal sepal similar, ovate-elliptic, strongly concave, about 5 mm. long and 2.6 mm. wide, subacute or obtuse at the apex, 3-nerved. Petals broadly spatulate, about 2.5 mm. long and 1.5 mm. broad, 1-nerved, abruptly acute or apiculate, with a dilated base, somewhat asymmetric, with scattered indistinct papillae near the apex. Lip ovate in outline, about 3 mm. long and 2 mm. wide when expanded; lower portion (almost a third) oblong, minutely auriculate at base, rather abruptly dilated into a sagittate lamina with a minute sharp decurved lobule on each side; the anterior portion is very fleshy and subglobose-thickened. Column slender, about 2.1 mm. long, terminating in a tridentate membranaceous wing.

Another collection, (*im Thurn 172*) contains a plant about 6 cm. high with stems 5 mm. or more long, leaves 2 cm. long and 7 mm. wide (immature leaves are much smaller) and peduncle about 3.1 cm. long. It has the lamina of the lateral sepals about 6 mm. long and 3.2 mm. wide, distinctly bidentate at the apex; dorsal sepal about 5.5 mm. long. 3 mm. wide, rounded at the apex; petals 2.8 mm. long, 1.8 mm. wide. Another collection, (*im Thurn 116*) has spatulate-oblanceolate leaves; dorsal sepal about 6 mm. long; petals 2.5 mm. long and about 2 mm. wide.

Pleurothallis diffusiflora seems to be allied to *P. hians* Lindl., but the flowers are smooth inside with an unguiculate very different lip.

British Guiana, Essequibo River, Moraballi Creek, near Bartica. Nearly at sea-level. "Epiphyte, in Wallaba forest. Sep. greenish-yellowish-mauve, mottled with chocolate. Upper pet. and labellum dark chocolate." October 7, 1929. *N. Y. Sandwith 474* (Type in Herb. Kew.); Barama Falls, "5 x 1. 96." *E. F. im Thurn 172* (Herb. Kew.): *im Thurn 116* (Herb. Kew.): Near No. 6 Camp, Barima-Barama Road. "Sepals pale yellow green with distinct scattered spots of deep rich purple; petals the color of sepals but purple spots more numerous especially at the upper edges which are quite covered by the deeper color; lip with an almost bulbous swelling at apex which is light bright purple, otherwise yellow green with closely set small dark purple spots along edge and a large patch of deep purple at foot of column." February 1897. *im Thurn 178* (Herb. Kew.)

Pleurothallis minima *C. Schweinfurth sp. nov.*

Herba minima, caespitosa. Radices fibrosae, crassae. Caules brevissimi, unifoliati. Folium cuneato-spathulatum vel spathulato-ellipticum, marginatum. Inflorescentia singula, filiformis, pauciflora. Sepala lateralia in laminam rotundato-ellipticam bidentatam connata. Sepalum dorsale lanceolatum. Petala elliptico-lanceolata, falcata, fimbriata. Labellum simplex, oblongum, apice rotundatum, margine longe ciliatum.

Plant minute, caespitose. Roots fibrous, glabrous, stout for the plant. Stems very short, about 1.5 mm. long, unifoliate, 1-jointed, entirely concealed by a tubular membranaceous evanescent sheath. Leaf cuneate-spatulate to spatulate-elliptic, up to 7 mm. long and 3 mm. wide, acute to rounded at the apex, cuneate-narrowed at base, marginate. Inflorescence solitary, filiform, subequaling or exceeding the leaf, up to 5-flowered. Flowers membranaceous, large for the plant. Lateral sepals connate to above the middle forming a round-elliptic sharply

bidentate lamina which is about 2 mm. long and subequally broad, 2- or less distinctly 4-nerved. Dorsal sepal lanceolate, nearly 2.7 mm. long, about 1 mm. wide, acute, concave, indistinctly 3-nerved. Petals elliptic-lanceolate, falcate, about 1.9 mm. long and 0.9 mm. wide, acuminate, more or less obtuse, fimbriate on the margins except near the base, 1-nerved. Lip simple, oblong with strongly revolute margins, when expanded about 2 mm. long and 0.6 mm. broad, rounded at the apex, minutely unguiculate with parallel auricles at base, convex but longitudinally sulcate through the middle of the lower half, provided with fine cellular hairs on the margin especially near the apex. Column strongly arcuate, about 1.2 mm. long, with a concave membranaceous wing which is dilated tridentate and denticulate at the apex, extended into a short foot.

Pleurothallis minima is allied to *P. barbulata* Lindl., but differs in having fimbriate petals and a scape which commonly surpasses the leaf. It differs from *P. ciliolata* Schltr. in its smaller flowers and dissimilar lip.

British Guiana, B.-B. [Barima-Barama] Road. "25. VIII 96." *E. F. im Thurn 166* (Type in Herb. Kew.)

Pleurothallis pertenuis *C. Schweinfurth sp. nov.*

Herba nana, tenuissima, caespitosa. Caules brevissimi, unifoliati. Folium lineare vel oblanceolato-lineare. Scapus uni- vel biflorus, tenuis, folium subaequans vel superans. Sepala lateralia in laminam usque ad medium bidentatam elliptico-ovatam connata. Sepalum dorsale lanceolatum. Petala anguste oblongo-spathulata, valde obliqua, abrupte acuta. Labellum sagittato-oblongum cum angulis triangularibus infra medium, apice rotundatum.

Plant dwarf, very slender, caespitose. Roots fibrous, glabrous, numerous. Stems very short, monophyllous,

about 3.7 mm. or less long, 1-jointed, entirely concealed by two imbricating tubular scarious sheaths. Leaf narrowly linear or oblanceolate-linear, very coriaceous, deeply longitudinally sulcate above and carinate beneath in the dried specimen, in fresh material probably fleshy, acute or minutely tridenticulate at the apex, narrowed to a more or less distinct sulcate petiole, up to 2.2 cm. long and 1.7 mm. wide when expanded. Inflorescences slender, 1-flowered, in anthesis slightly surpassing the leaves, minutely puberulent. Pedicel conspicuously exserted beyond the infundibuliform puberulent sheath. Lateral sepals connate forming an elliptic-ovate lamina which is sharply bidentate about to the middle, about 4.1 mm. long and 2.2 mm. wide across the middle, prominently 2-nerved with an indistinct nerve on each side. Dorsal sepal lanceolate, 4 mm. long, 1.8 mm wide, acute, concave, 3-nerved. Petals very asymmetrically oblong-spatulate, about 2.7 mm. long and 1 mm. wide near the apex, obliquely and abruptly acute, 1-nerved. Lip sagittate-oblong, with sharp-triangular spreading angles just below the middle, 3 mm. long, about 1.4 mm. wide across the lateral angles, rounded at the apex, 1-nerved throughout or 3-nerved to the middle, finely papillose on the upper surface. Column stout, about 2 mm. long on the dorsal surface, narrowly winged on each side. Ovary slenderly turbinate, muricate.

A sheet in the Kew Herbarium consists of apparently different collections of this species, but they all are designated as *im Thurn 84*. Some plants of this number show flat leaves, others 2-flowered scapes, and one flower (separate) has the lamina of the lateral sepals about 2.3 mm. wide and distinctly 4-nerved, and also has petals which are 2-nerved and are somewhat broader below than in the type. Another collection (*Jenman 1996*) shows a similarly 4-nerved lamina of the lateral sepals and 2-nerved

petals. Both of these collections appear to consist of more mature plants than the typical number.

Pleurothallis pertenuis appears to be very close to the Costa Rican *P. vittariifolia* Schltr., but differs in its glabrous sepals. It is dissimilar to *P. uniflora* Lindl. in its much shorter stems, smaller leaves and deeply bidentate lamina of the lateral sepals. It is apparently allied to *P. hymenantha* Lindl., but has shorter stems and dissimilar shorter petals.

British Guiana, Essequibo River, Moraballi Creek, near Bartica. Nearly at sea-level. "Minute epiphyte. Fl. brownish orange in bud." September 15, 1929. *N. Y. Sandwith 304* (Type in Herb. Kew.) : Aruka. June 1897. *E. F. im Thurn 84*: B.-B. [Barima-Barama] Road. November 1896. *im Thurn 84*: Roriabo. "7. XI. 94. Fl. deep orange." *im Thurn 84*: Pomeroon River. March 1884. *George Jenman 1996* (All in Herb. Kew.)

Octomeria erosilabia *C. Schweinfurth sp. nov.*

Herba rigida, crassa. Rhizoma repens. Caules pauciarticulati. Folia erecta, oblongo-linearia vel lineari-elliptica, valde coriacea, acuta, breviter petiolata. Inflorescentiae dense glomeratae; flores numerosi. Sepala lanceolata, acuminata. Petala similia, ovato-lanceolata. Labellum prope basim trilobatum; lobi laterales parvi, auriculiformes; lobus medius multo major, ovato-oblongus, marginibus erosis; discus bicarinatus.

Plant rigid, stout. Rhizome creeping, stout, woody, concealed by the imbricating fibres of sheaths. Roots fibrous, glabrous, branching, numerous. Stems erect or ascending from a decumbent base, about 9–16 cm. long, monophyllous, 3- to 4-jointed, mostly concealed by close cylindrical evanescent sheaths, longitudinally sulcate and 4-angled in the dried specimen, about 1 cm. apart on the rhizome. Leaves oblong-linear or linear-elliptic, rigidly erect, shortly but distinctly petioled; blades 9 to about 17 cm. long (the longest blade incomplete), about 1 cm.

wide between the revolute margins,acute,shortly cuneate at base, very thick-coriaceous, with the mid-nerve sulcate above and prominent beneath, conduplicate when young: petioles 0.8–1.8 cm. long, sulcate, laterally compressed. Inflorescences densely capitate and axillary, many-flowered. Flowers apparently subfleshy. Lateral sepals free, lanceolate, slightly asymmetric, acuminate, 6 mm. long, 2 mm. wide near the base, 4-nerved. Dorsal sepal similar, apparently a little shorter and narrower than the lateral sepals. Petals ovate-lanceolate, acuminate, 5.5 mm. long, 1.8 mm. wide, 3-nerved. Lip 3-lobed near the base, oblong-ovate in outline, minutely clawed,3 mm. long,about 2 mm. wide across the lateral lobes, shortly cuneate to the claw; lateral lobes rounded auriculate, relatively small; middle lobe ovate-oblong, 2 mm. long, about 1.2 mm. wide near the contracted base, denticulate-erose on the anterior margins, tridenticulate at the subtruncate apex; disc 3-nerved, with a pair of keels extending from the centre of each lateral lobe to the centre of the middle lobe. Column small, about 1.3 mm. long on the dorsal surface. Pollinia eight, obliquely complanate-pyriform.

Another sheet of this collection (*Jenman 1989*) preserved in the Herbarium of the New York Botanical Garden, shows the smallest secondary stem 8.3 cm. long and one leaf about 1.2 cm. wide.

Octomeria erosilabia differs from *O. tridentata* Lindl. in having commonly longer stems, consistently longer leaves, subfleshy flowers, broader petals and erose lip. It is vegetatively larger and has a smaller lip than *O. igua-pensis* Schltr.

British Guiana, Pomeroon River. March 1884. *George Jenman 1989* (Type in Herb. Kew. Duplicate type in Herb. N.Y. Bot. Gard.)

Octomeria exigua *C. Schweinfurth sp. nov.*

Herba tenuissima, caespitosa. Radices fibrosae, nu-

merosae. Caules filiformes, uniarticulati. Folium erectum, lineare, carnosum ut videtur. Flos membranaceus. Sepala petalaque acuta, trinervia. Sepala lateralia oblongo-lanceolata, libera. Sepalum dorsale simile, paulo majus. Petala lanceolato-elliptica. Labellum obovatum, supra medium leviter trilobatum, late obtusum, inferne cuneatum. Columna brevis, crassa.

Plant small and slender, about 4.5 cm. or less high. Roots fibrous, numerous, glabrous. Stems filiform, unifoliate, up to about 1.5 cm. high, 1-jointed. Leaves linear linear-oblong or elliptic-linear, apparently fleshy in fresh material, very shortly petioled, acute to rounded at the tip, erect; blades 1.3–1.95 cm. long and 1–2 mm. wide. Inflorescences axillary, fascicled, apparently one flower present at a time. Flower membranaceous. Sepals and petals acute, 3-nerved. Lateral sepals free, oblong-lanceolate, about 3.5 mm. long and 1 mm. wide. Dorsal sepal similar, about 3.7 mm. long and 1.2 mm. wide. Petals elliptic-lanceolate, about 3.1 mm. long, 1 mm. wide. Lip obovate in outline, 1.6 mm. long, about 1 mm. wide above the middle, broadly obtuse, somewhat trilobed near the apex with rounded subequal lobes, cuneate toward the base, 3-nerved. Column very short, stout, about 1 mm. long on the dorsal surface.

The above description is based on two plants (mounted on the herbarium sheet with *Octomeria integrilabia* C. Schweinf.) of which one bears only a cylindrical ribbed fruit, but is closely similar to the flower-bearing plant beside it. The single flower present has somewhat distorted perianth segments. There appear to be no near allies.

British Guiana, Hoodsline [?]. February 1896. *E. F. im Thurn 115 B* (Type in Herb. Kew.)

Octomeria integrilabia *C. Schweinfurth sp. nov.*

Herba pusilla, caespitosa. Radices numerosae. Cau-

les graciles, breves, juventute vaginis arctis tubularibus omnino tecti. Folium singulum, probabiliter semicylindricum, acutum. Inflorescentiae axillares, uni- vel pauciflorae. Flores membranacei. Sepala lanceolata vel ovato-lanceolata, uninervia; lateralia paulo obliqua et saepe libera. Petala sepalis lateralibus similia. Labellum simplex, subquadrato-ellipticum, bidentatum. Column parva, arcuata, basi incrassata.

Plant slender, caespitose, 4.7–9.5 cm. high. Roots fibrous, glabrous, very numerous. Stems about 1–5 cm. long, 1- or 2-jointed, slender, when young entirely concealed by close tubular evanescent sheaths, unifoliate, erect or spreading. Leaf slender, probably semicylindric and channelled when fresh, shortly and indistinctly petioled, often arcuate and conduplicate in the dried specimen, about 2.1–4.9 cm. long, up to 2 mm. wide, abruptly acute. Flowers solitary or few, membranaceous. Lateral sepals ovate-lanceolate to linear-lanceolate, free or connate to the middle, about 3.8–5 mm. long, 1–1.6 mm. wide, acute to shortly acuminate, somewhat asymmetric, prominently 1-nerved with two indistinct supplementary nerves at the base. Dorsal sepal similar, 4–5.5 mm. long, 1–2 mm. wide, acute or shortly acuminate. Petals linear-lanceolate oblong-lanceolate or elliptic-lanceolate, acute or acuminate, 4–4.8 mm. long, 1–1.6 mm. wide, 1-nerved, asymmetric. Lip simple, subquadrate-elliptic, about 2–2.7 mm. long, 1.8–2 mm. wide, bidentate at the apex, cordate at the base, 3-nerved. Column small, slender, about 1.2–1.5 mm. long, arcuate, dilated at base, with a prominent terminal truncate or rotundate wing and a reflexed rostellum.

This species is represented by several collections. One herbarium sheet (designated in the handwriting of R. A. Rolfe as *E. F. im Thurn 115A?*) consists of several apparently different collections and is taken as the type.

Octomeria integrilabia is remarkable in having a simple lip.

British Guiana, [Composite sheet]–Arakaka. January 1896. *E.F. im Thurn 115 ??*: Hoodsline [?]. White-flowered. February 1896. *im Thurn 115A*: *im Thurn 167* (Type in Herb. Kew.): [Another sheet]–Arakaka. Febauary 1896. *im Thurn s.n.* (Herb. Kew.)

Octomeria minor *C.Schweinfurth sp. nov.*

Herba parvula, epiphytica, caespitosa. Radices fibrosae, longae, numerosae. Caules perbreves, uniarticulati, vaginis tubularibus omnino obtecti. Folium singulum, erectum, lineari- vel elliptico-lanceolatum, carnosum ut videtur. Inflorescentiae axillares, multiflorae. Sepala oblongo-lanceolata, acuminata, trinervia. Petala lanceolata, paulo minora. Labellum infra medium trilobatum; lobi laterales parvi, rotundato-auriculiformes, patentes; lobus medius multo major, ovatus, margine minute erosus. Columna gracilis.

Plant small and very short for the genus, caespitose, up to 3.8 cm. high, rather stout. Roots fibrous, long, glabrous, numerous. Stems short, 1-jointed, up to about 1.4 cm. high, entirely concealed by two close tubular imbricating evanescent sheaths. Leaf solitary, erect, linear-lanceolate to elliptic-lanceolate, sessile, up to 2.4 cm. long and 4.5 mm. wide, acute, marginate, apparently fleshy in the fresh condition. Inflorescence axillary, many-flowered. Sepals oblong-lanceolate, shortly acuminate, 3-nerved. Lateral sepals free, about 6.5 mm. long and 1.9 mm. wide. Dorsal sepal very similar, concave. Petals lanceolate, 5.3 mm. long, 1.4–1.5 mm. wide, acuminate, 1-nerved throughout or 3-nerved to about the middle, somewhat asymmetric. Lip oblong-obovate in outline, about 3.1 3.5 mm. long, 2 mm. wide, 3-lobed below the middle; lateral lobes small, round-auriculiform, spreading; middle lobe ovate or broadly ovate,

broadly truncate or abruptly acute at the apex, minutely erose except on the basal margins; disc rather abruptly narrowed below the lateral lobes, 3-nerved, bicarinate with the keels extending from the centre of the lateral lobes almost to the middle of the mid-lobe. Column cylindric, slightly arcuate and abruptly bent back near the summit, about 1.9 mm. long measured on the dorsal surface, with an elongated stigmatic orifice, extended into a relatively long foot. Anther conic-semiovoid. Pollinia eight, obliquely complanate-pyriform.

Octomeria minor differs from *O. rigida* Rodr. in its small vegetative proportions, less acuminate floral segments, 3-nerved petals and membranaceous lip.

British Guiana, Essequibo River, Moraballi Creek, near Bartica. Nearly at sea-level, "Epiphyte on the entomologist's tree (Morabukea). Fl. cream." August 24, 1929. *N. Y. Sandwith 112* (Type in Herb. Kew.)

Octomeria parvula *C. Schweinfurth sp. nov.*

Herba pusilla, epiphytica, caespitosa. Radices fibrosae, numerosae. Caules pauciarticulati, unifoliati. Folium crassum ut videtur, lineari-ellipticum. Inflorescentiae axillares, pauciflorae. Flos membranaceus. Sepala lanceolata vel ovato-lanceolata, trinervia, persimilia. Petala paulo minora. Labellum in circuitu ovato-ellipticum, prope medium trilobatum; lobi laterales parvi, auriculiformes; lobus medius multo major, acutus, dentatus vel denticulatus.

Plant small, slender, caespitose, about 8 cm. or less tall. Roots fibrous, glabrous, numerous. Stems filiform, decumbent at base, 1- to 3-jointed, 4.2 cm. or less long, unifoliate, entirely concealed by close tubular sheaths which are commonly evanescent. Leaf linear-elliptic, apparently very fleshy in the fresh state, shortly petioled to subsessile, acute, erect or erect-spreading; blade up

to 3.4 cm. long and 4.5 mm. wide, the mid-nerve prominent beneath. Inflorescences axillary, fascicled, one or two flowers appearing at a time. Flower membranaceous. Sepals 3-nerved. Lateral sepals free, lanceolate to ovate-lanceolate, 3.5–4.5 mm. long, 1.2–2 mm. wide, obtuse acute or acuminate, somewhat asymmetric. Dorsal sepal very similar, concave. Petals lanceolate or ovate-lanceolate, about 3–3.5 mm. long, 1–1.5 mm. wide, acuminate, 1-nerved with a short supplementary nerve on each side at the base, more or less asymmetric. Lip ovate-elliptic in outline, 3-lobed near the middle, about 2 mm. long and 1.8 mm. wide across the lateral lobes; lateral lobes small, rounded-auriculiform; middle lobe much larger, ovate, acute, erose-dentate or denticulate near the apex; disc 3-nerved, bicarinate with the keels extending from the middle of the lateral lobes almost to the middle of the mid-lobe. Column arcuate-cylindric, dilated at the base, about 1.4 mm. long on the posterior surface, extended into a prominent foot. Pollinia complanate-pyriform.

The specimen from Arakaka (*im Thurn s.n.*) shows two stems about 5–5.5 cm. high of which one is distinctly 4-jointed. The column of the single flower present is about 1.1 mm. long, measured on the dorsal surface.

Octomeria parvula is vegetatively similar to *O. parvifolia* Rolfe, but differs markedly in flower structure.

British Guiana, Essequibo River, Moraballi Creek, near Bartica. Nearly at sea-level. "Epiphyte. Fl. wholly lemon-yellow (including stele and labellum)." September 11, 1929. *N. Y. Sandwith 234a* (Type in Herb. Kew.): Arakaka. February 1896. *E. F. im Thurn s.n.* (Herb. Kew. on sheet with *Octomeria integrilabia* C. Schweinf.)

CORRECTIONS

On page five of Number 1 (1932) of the Botanical Museum Leaflets, a supposedly new combination *Dipteryx panamensis* was made. Recently it has been learned that this combination was made by Record and Mell in 1924. The correct citation should read *Dipteryx panamensis* (Pittier) Record & Mell Timbers Trop. Am. (1924) 303.

Furthermore, in a recent number (Bot. Mus. Leafl. 3 (1935) 39), an error in citation was made. Line 21 should read *Pleurothallis biflora* Schlechter in Fedde Repert. Beihefte 19 (1923) 181.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, MARCH 6, 1935 VOL. 3, NO. 7

A FOURTH POLYMORPHIC ALLIANCE IN EPIDENDRUM

BY

OAKES AMES, F. TRACY HUBBARD AND CHARLES SCHWEINFURTH

THROUGHOUT our studies of North American Epidendrum, one group of species has been a constant source of perplexity. In part this perplexity has arisen from an inadequate knowledge of the types, and in still greater measure from the variability and close affinity of the species. The first difficulty (inadequate knowledge of the types) has been removed by the receipt of flowers from the types of *Epidendrum oncidioides* Lindl., *E. graniticum* Lindl., *E. gravidum* Lindl., *E. Mooreanum* Rolfe and *E. profusum* Rolfe, for which we have to thank Sir Arthur W. Hill, Director of the Royal Botanic Gardens, Kew, and of a flower from the type of *E. guatemalense* Klotzsch which was kindly sent to us by Dr. Rudolf Mansfeld of the Botanisches Museum, Berlin-Dahlem. The second source of confusion (variability and close affinity of the species) has been gradually eliminated by the receipt of more material, among which were certain linking forms, and by a critical study of the various elements. These comparisons and the true interpretation of formerly uncertain types have led us to believe that here again we are dealing, not with several distinct species, but with an alliance composed of varying forms of a single poly-

morphic species.

Epidendrum oncidioides alliance

The constituents of this alliance present several marked lines of variation: in the stature of plant, in the character of inflorescence, in verrucosity of the ovary, and in the presence or absence of auriculate emergences of the column. The extremes of these variations would seem to indicate good species and have been so recognized, but the presence of intergrades and specimens showing a combination of characters point to one variable species. The trends of variation or the linkage of characters, however, render recognizable a typical form and five varieties.

The typical form of *Epidendrum oncidioides* as described and figured by Lindley from a plant sent to him by Richard Harrison, probably from South America, is a tall plant with a panicle about three feet long. The pseudobulb is ellipsoid and bears three ensiform leaves nearly two feet long and two inches wide. The inflorescence is an open panicle with the widely divaricate branches distant and not very long. The flowers are shown as being about three centimeters in diameter. The sepals and petals are dull chrome yellow, heavily blotched toward their apex with a dull red-brown and are greenish yellow on their exterior surface. The lip is a dull chrome yellow with short brown-purple lines on the mid-lobe. The sepals are shown as cuneate-oblanceolate with obtuse tips. The petals are round-spatulate with a narrow claw and are inrolled on the apical margin. The lip is distinctly 3-lobed with a well-marked isthmus, with the lateral lobes erect, clasping the column and oblong, their apices rounded and the mid-lobe is suborbicular and cuspidate (due to the inrolling of the apical margins).

The following synopsis sets forth briefly the characters of the concepts that have formerly been considered

separate entities.

Epidendrum graniticum Lindl. of which the type is *Schomburgk 195* from British Guiana. It is described as having attenuate ovoid pseudobulbs with two ensiform leaves much shorter than the many-flowered panicle. The sepals and petals are spreading and lanceolate, subequal and acute. The lateral lobes of the lip are linear-oblong, the mid-lobe unguiculate and obovate with the inflexed apex acute. Schomburgk noted the sepals and petals as green dotted with purple, the lip as white with a purple stain at its base and the stem six feet high. The photograph of the type shows the petals as spatulate-oblanceolate.

Epidendrum gravidum Lindl. of which the type was collected by Hartweg at Xapatam, Mexico. It is described as having a scape nearly six inches high with four long-stalked horizontal green flowers, which never open. The ovary is described as olive-green, covered with pale-green warts. The flowers are said to be pendulous and long-pedicellate. Lindley's statement that the flowers never open is not borne out by specimens clearly referable to this form, although the flowers of his specimen (as illustrated in Sched. Orch. 4 (1923) t. 2) apparently did not open.

Epidendrum guatemalense Klotzsch of which the type was from Guatemala growing in the orchid-house of Mr. Allardt. It is described as 2-leaved, the leaves linear-lanceolate, 11–18 inches long and ½–1 inch broad. The sepals and petals are green minutely spotted with brown-violet; the sepals oblong, attenuate at both ends; the petals spatulate and short-acute. The lip is white, the lateral lobes enfolding the column, the mid-lobe orbicular, deflexed and with narrow parallel violet lines. The auricles of the column, as seen in the flower from the type, are not so pronounced as one is led to believe from

the description.

Epidendrum oncidioides Lindl. var. *graniticum* Lindl. is based on *E. graniticum* Lindl.

Epidendrum spectabile Focke of which the type was collected in Surinam by Focke. It is described as having 2- to 3-leaved pseudobulbs, the leaves ensiform or linear and two feet long. The inflorescence is paniculate and two to three feet long. The sepals are oblong-obovate and the petals orbicular-ovate and unguiculate. Both sepals and petals are pale greenish and densely spotted with dark purple. The lip is 3-lobed; the lateral lobes oblong, surrounding the column; the mid-lobe suborbicular, violet striped, with the margin crisped. The ovary is said to be muricate.

Epidendrum affine Focke of which the type was collected in Surinam by Focke. The plant is described as having 2-leaved turbinate pseudobulbs with the ensiform or linear leaves scarcely a foot long. The inflorescence is two feet high and paniculate. The sepals are broadly lanceolate and apiculate, and the petals spatulate. The lip is 3-lobed with the lateral lobes oblong and the mid-lobe suborbicular and apiculate. The sepals and petals are greenish, the lip is white.

Epidendrum giganteum Hort. Belg. apud Planch. is a nomen applied in horticulture to a form referable to var. *gravidum*.

Epidendrum Guillemianum Hort. apud Planch. is said to be from Mexico and is a nomen applied to a form referable to var. *gravidum*.

Epidendrum ramonense Reichb. f. of which the type is *Wendland 1009* (*1007?*) collected at San Ramon, Costa Rica. It is described as having a diffuse panicle with the branches fractiflex and somewhat asperate. The sepals are cuneate-oblong, acute, the petals spatulate-obovate, obtusely acute. The lip has ligulate, obtuse lateral lobes

and a cordate-triangular mid-lobe. The perianth segments are brown-green, the lip white with red stripes. The drawing in the Reichenbachian herbarium shows the reflexed column which is diagnostic of this variety.

Epidendrum Mooreanum Rolfe of which the type was a plant from Costa Rica sent to Kew by Mr. F. W. Moore. It is described as having linear leaves one foot long and 9–11 lines broad, a sparsely branched panicle and an asperate-verrucose ovary. The sepals are lanceolate-linear, subacute; the petals oblanceolate, subobtuse. The lip is about 5 lines long, the lateral lobes subspatulate, the mid-lobe broadly elliptic [actually almost suborbicular]. The perianth segments are pale green, the lip deep purple [?], the "front lobe" broadly margined with very light green.

Epidendrum profusum Rolfe of which the type is supposed to be from Mexico. It is described as having ovoid pseudobulbs with two or three leaves which are ligulate, 18–35 cm. long and 1.5–2.5 cm. broad. The inflorescence is a subcompact many-flowered panicle. The sepals and petals are pale yellow-green; the sepals oblong-lanceolate, subobtuse, 2.3 cm. long; the petals spatulate-lanceolate, subobtuse, 2.3 cm. long. The lip is 1.8 cm. long, white, the mid-lobe purple lined; the lateral lobes oblong; the mid-lobe elliptic or suborbicular, the veins verruculose.

Encyclia Mooreana Schltr. based on *Epidendrum Mooreanum* Rolfe.

Encyclia oncidioides Schltr. based on *Epidendrum oncidioides* Lindl.

Encyclia gravida Schltr. based on *Epidendrum gravidum* Lindl.

Encyclia ramonensis Schltr. based on *Epidendrum ramonense* Reichb.f.

Encyclia granitica Schltr. based on *Epidendrum graniticum* Lindl.

Epidendrum alanjense Ames of which the type was collected by Pittier at Alanje in the Province of Chiriqui, Panama. It is described as having 2-leaved pseudobulbs, the leaves ligulate, up to 30 cm. long and 1.4 cm. wide. The inflorescence is racemose and has about six flowers. The pedicellate ovary is said to be scabridulous. The sepals are narrowly elliptic-oblong, the petals are elliptic-spatulate. The 3-lobed lip is about 13 mm. long; the lateral lobes are triangular-lanceolate and obtuse; the mid-lobe is orbicular; the nerves minutely papillose.

Encyclia Hunteriana Schltr. of which the type is *Powell 84* collected near David in the Province of Chiriqui, Panama. It has olive-green flowers with a white lip striped with red and is reducible to *Epidendrum alanjense* Ames.

Encyclia Powellii Schltr. of which the type is *Powell 83* collected in the Province of Chiriqui, Panama. Dr. Schlechter compares the species with *Epidendrum profusum* Rolfe, but it is reducible to *E. ramonense* Reichb. f.

Epidendrum amandum Ames of which the type is *Powell 271* collected in the foothills east of Panama City, Panama. It is described as having 1- or 2-leaved pseudobulbs; the leaves ligulate, 4–15 cm. long, 1 cm. wide. The peduncle with the raceme is 8–14 cm. long, equalling the leaves, the raceme is 2- to 4-flowered. The pedicellate ovary is smooth. The sepals are narrowly elliptic-oblong, the petals are spatulate or oblanceolate. The lip has oblong, obtuse lateral lobes and a suborbicular mid-lobe; the isthmus between the lateral lobe and the mid-lobe is said to be almost obsolete.

Epidendrum peraltense Ames of which the type is *Lankester & Sancho 378* collected at Peralta, Costa Rica. It is described as having 3-leaved pseudobulbs, the leaves

ligulate, 18–30 cm. long and 2–2.5 cm. wide. The peduncle with the inflorescence is about 40 cm. long. The inflorescence is paniculate with the branches abbreviated. The pedicel and ovary are smooth. The sepals are ligulate, narrowed toward both ends and the petals are narrowly oblanceolate. The lateral lobes of the lip are oblong and are separated from the orbicular-ovate mid-lobe by a short isthmus. The flowers are greenish yellow and the lip has purple markings. This form is suggestive of var. *ramonense*, but has the straight column of the species proper.

Encyclia Brenesii Schltr. of which the type is *Brenes 273* collected at San José de San Ramon, Costa Rica. From the description and the drawings sent to us by Dr. Schlechter, this species appears reducible to *Epidendrum Mooreanum* Rolfe.

Encyclia Tonduziana Schltr. of which the type is *A. & C. Brade 1274* collected at Cismo near San Jeronimo de Grecia, Costa Rica. From the description and the drawings sent to us by Dr. Schlechter, this species seems reducible to *Epidendrum Mooreanum* Rolfe though the lateral lobes of the lip approach the typical form in shape.

A tabulated study of the available specimens of the various constituent species of the alliance (species formerly believed to be distinct) brought out the following lines of separation:

1. The presence or absence of lateral auricles on the column. These auricles are sometimes reduced to more or less developed teeth.
2. The column more or less sharply reflexed in the middle as opposed to the column straight.
3. The shape of the petals and their breadth as compared with that of the sepals.
4. The shape of the lateral lobes of the lip.

5. The length of the lateral sepals in combination with minor variation in the shape of the lateral lobes of the lip.
6. The shape of the lateral lobes of the lip in combination with the transition from the cushion callus to the three central nerves of the lip.

Basing determinations on these lines of separation, one is able to differentiate six variants which are, in the main, reasonably constant florally though often quite variable vegetatively, especially so in regard to the inflorescence and the size of the plant.

As one would expect, these variations show some intergrades, but we believe that they may be considered as a species and five varieties.

Key to the varieties of Epidendrum oncidioides

a. Column with a distinct lateral auricle or well-developed tooth on each side

b. Column more or less sharply reflexed in the middle, veins of the mid-lobe of lip usually smooth or nearly so.

c. Petals broadly spatulate-oblanceolate, commonly markedly broader than the sepals; column with conspicuous rounded auricles; sepals and petals blotched with red-brown or dotted with red-purple

oncidioides

c. Petals merely oblanceolate, little broader than the sepals or sometimes narrower; column with narrow tooth-like auricles when auriculate; sepals and petals self-color greenish or greenish yellow

var. *ramonense*

b. Column nearly straight (not at all reflexed or slightly recurved); veins of the mid-lobe of lip verruculose

c. Lateral lobes of lip triangular-lanceolate (rarely triangular-ovate) to oblong

var. *gravidum*

c. Lateral lobes of lip spatulate or oblong-spatulate

d. Lateral sepals 15 mm. or less long (usually much less); lateral lobes of lip spatulate

var. *Mooreanum*

d. Lateral sepals 20 mm. or more long; lateral lobes of lip oblong-spatulate

var. *profusum*

a. Column without a distinct lateral auricle on each side, at most with a small angulate tooth

b. Column more or less sharply reflexed in the middle; veins of the mid-lobe of lip usually smooth

var. *ramonense*

b. Column nearly straight (not at all reflexed or slightly recurved); veins of the mid-lobe of lip commonly verruculose

c. Lateral lobes of lip spatulate or oblong-spatulate

var. *Mooreanum*

c. Lateral lobes of lip not spatulate nor oblong-spatulate

d. Lateral lobes of lip oblong-pandurate; transition from the apically bidentate cushion-callus to the nerves abrupt

var. *perplexum*

d. Lateral lobes of lip triangular-lanceolate (rarely triangular-ovate) to oblong; transition from the cushion-callus to the three central nerves gradual

var. *gravidum*

Epidendrum oncidioides *Lindley* in Bot. Reg. 19 (1833) t. 1623.

Epidendrum graniticum Lindley in Hooker Lond. Journ. Bot. 3 (1841) 83.

Epidendrum guatemalense Klotzsch in Allg. Gartenz. 20 (1852) 250.

Epidendrum oncidioides Lindl. var. *graniticum* Lindley Fol. Orch. Epid. (January 1853) p. 11.

Epidendrum spectabile Focke in Bot. Zeit. 11 (April 1, 1853) 229.

Epidendrum affine Focke in Bot. Zeit. 11 (May 6, 1853) 341.

Encyclia oncidioides Schlechter Orchideen (1914) 210.

Encyclia granitica Schlechter in Fedde Repert. Beihefte 6 (1919) 74.

Plant up to a meter tall with a creeping rhizome. Roots fibrous, stout, glabrous. Pseudobulb ovoid, slender-pyriform or cylindric, up to about 10 cm. long, invested by imbricating fibrous, scarious sheaths, 2- to 3-leaved. Leaves up to 60 cm. long, up to 4.8 cm. broad, commonly much smaller, linear-ligulate to oblong-linear, obtuse to acute, more or less conduplicate below, strongly coriaceous. Inflorescence surpassing the leaves, loosely paniculate or rarely subsimple, with relatively short spreading branches. Flowers medium-sized with spreading segments. Pedicellate ovary smooth to verruculose. Lateral sepals elliptic-lanceolate, oblong-oblanceolate or oblanceolate, more or less asymmetric, 14–18 mm. long, 5–6.5 mm. wide, acute to short-acuminate, dorsally more or less carinate-thickened near the tip. Dorsal sepal elliptic-lanceolate to oblanceolate, 14–17 mm. long, 5–6.2 mm. wide, acute to subacute. Petals elliptic-spatulate, obovate-spatulate or round-spatulate with a narrow claw, 13–16.9 mm. long, 6–8 mm. wide, short-acuminate, acute or rounded with an acute tip. Lip almost free from the column, deeply 3-lobed, 13.1–15 mm. long from base of column to tip of mid-lobe; lateral lobes erect and clasping the column in natural position, horizontally spreading when expanded, very asymmetrical, oblong, oblong-panduriate, triangular-oblong to obliquely ovate, 5.6–8.9 mm. long on the interior margin, apex obtuse to broadly rounded; mid-lobe separated from the lateral lobes by a short and distinct isthmus, suborbicular-ovate (rarely), suborbicular to transversely oval, 6–7.3 mm. long, 6.2–9.8 mm. wide, apex acute to broadly rounded or slightly retuse and apiculate, base subcordate to rounded and somewhat cuneate, anterior margin plicate, veins smooth or rarely verruculose; disc with two fleshy ridges making a fovea on the isthmus and extending into fleshy radiating lines on the mid-lobe, the central one sometimes

prominently carinate-thickened. Column stout, gently reflexed about at the middle, with prominent incurved rounded auricles, 7.2–8.5 mm. long dorsally.

DISTRIBUTION: Mexico, Guatemala, Honduras, Trinidad, Colombia, Venezuela, Dutch Guiana (Surinam), French Guiana and Brazil.

Epidendrum oncidioides *Lindl.* var. **ramonense** (*Reichb.f.*) *Ames, Hubbard & Schweinfurth comb. nov.*

Epidendrum ramonense Reichenbach filius Beitr. Orch. Centr.-Am. (1866) 81.
Encyclia ramonensis Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 473.
Encyclia Powellii Schlechter in Fedde Repert. Beihefte 17 (December 1922) 46.

Plant up to about one meter tall, caespitose with approximate pseudobulbs. Pseudobulbs ovoid to narrowly pyriform, 2- to rarely 4-leaved. Leaves linear-elliptic to lorate, up to 60 cm. long, up to 2.3 cm. wide, acute to rounded at the apex. Inflorescence much surpassing the leaves, laxly paniculate, the panicle simple or compound, with spreading often rather long branches. Pedicellate ovary smooth or slightly verruculose. Lateral sepals elliptic-lanceolate or oblong-lanceolate, more or less asymmetric, 14.2–18 mm. long, 3.7–4.8 mm. wide, acute or short-acuminate, dorsally carinate near the apex. Dorsal sepal elliptic-lanceolate to oblong-lanceolate, 14 17.8 mm. long, 3.6–4.8 mm. wide, acute or short-acuminate, thickened at the apex. Petals narrowly oblanceolate or oblanceolate to spatulate-oblanceolate, 14–17 mm. long, 3 5.5 mm. wide, subacute to short-acuminate, usually not much broader than the sepals. Lip 12 15 mm. long from base of column to tip of mid-lobe; lateral

lobes oblong, triangular-oblong, oblong-ovate or subquadrate-oblong, very asymmetric, more porrect when expanded than in the typical form, 4–6 mm. long on the interior margin, obtuse broadly rounded or subtruncate at apex; mid-lobe ovate or broadly ovate to suborbicular, 6.9–10 mm. long, 6.2–8.5 mm. wide, anterior margin plicate and more strongly inrolled toward the apex than in the typical form, short-acuminate to rounded at the apex, rounded-truncate or slightly cuneate at base; disc as in the typical form, but the veins more often somewhat verruculose. Column rather more reflexed than in the typical form, without auricles or with more or less distinct angles or small dentiform auricles, 7–8.4 mm. long dorsally.

DISTRIBUTION: Honduras, Costa Rica and Panama.

Epidendrum oncidioides *Lindl.* var. **gravidum** (*Lindl.*) *Ames, Hubbard & Schweinfurth comb. nov.*

Epidendrum gravidum Lindley in Journ. Hort. Soc. 4 (1849) 114: ampl. Ames in Sched. Orch. 4 (May 1923) 42, t. 2.

? Epidendrum giganteum Hort. Belg. apud J. E. Planchon Hort. Donat. (1855) 164, *nomen*, non Poiret.

? Epidendrum Guillemianum Hort. apud J. E. Planchon Hort. Donat. (1855) 164, *nomen*.

Encyclia gravida Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 472.

Epidendrum alanjense Ames in Sched. Orch. 1 (November 1922) 13.

Encyclia Hunteriana Schlechter in Fedde Repert. Beihefte 17 (December 1922) 46.

Encyclia Porcellii Schlechter apud Ames in Sched. Orch. 4 (May 1923) 35 in synon., *errore*.

Epidendrum amandum Ames in Sched. Orch. 4 (May 1923) 36.

Epidendrum peraltense Ames in Sched. Orch. 4 (May 1923) 46.

Plant very variable in size, much more so than in any other form of the alliance, 11 to approximately 60 cm. tall, caespitose with approximate pseudobulbs. Pseudobulbs pyriform-cylindric to broadly ovoid, 1- (rarely) to 3-leaved. Leaves linear-lorate to ligulate-lanceolate, 7–41 cm. long, 0.8–2.9 cm. wide. Inflorescence variable, simple and loosely few-flowered-racemose to rather densely compound-paniculate, shorter than or much exceeding the leaves. Pedicellate ovary smooth or verruculose to strongly muricate when mature. Flowers frequently somewhat smaller than those of var. *ramonense*. Lateral sepals elliptic-lanceolate or oblong-lanceolate, 10.6–19.4 mm. long, 2.9–4.8 mm. wide, acute to acuminate, dorsally thickened or carinate near the apex. Dorsal sepal oblong-lanceolate to elliptic-lanceolate or oblanceolate to elliptic-oblanceolate, 11–18.8 mm. long, 2.7–4.5 mm. wide, subacute to acuminate, thickened at the apex. Petals narrowly oblanceolate to spatulate-oblanceolate, 10–18.5 mm. long, 2.6–4.5 mm. wide, subacute to acute. Lip 10–15.1 mm. long from base of column to tip of mid-lobe; lateral lobes triangular-lanceolate to triangular-ovate or narrowly to broadly oblong (sometimes falcate), asymmetric often decidedly so, more or less porrect when expanded, 4.1–6.1 mm. long on the interior margin, obtuse to broadly rounded at the apex which is sometimes recurved; mid-lobe transversely oval to suborbicular or rhombic-ovate to suborbicular-ovate (rarely broadly obovate or weakly 3-lobulate), 4.8–10.2 mm. long, 5.1–8.1 mm. wide, short-acuminate to rounded (sometimes with a blunt apicule) or rarely truncate at the apex, cuneate to rounded at the base, margin plicate

or undulate near the apex or throughout; disc as in the typical form, the three to five central veins usually more prominent, all the veins apt to be verruculose to verrucose. Column straight to somewhat recurved, with obscure angles varying to large incurved rounded auricles, 5.1–7.5 mm. long dorsally.

Variety *gravidum* is the most variable and perplexing of all the varieties. The specimens which in the past were referred to *E. peraltense* show strong tendencies toward var. *ramonense* in the often somewhat recurved column, but the flowers are smaller and the lateral lobes of the lip are more apt to taper toward their apex and to approach, in this character, the form heretofore recognized as *E. gravidum*. The larger rounded auricles suggest the typical form of the species.

DISTRIBUTION: Mexico, Honduras, Nicaragua, Costa Rica and Panama.

Epidendrum oncidioides *Lindl.* var. **Mooreanum** (*Rolfe*) *Ames, Hubbard & Schweinfurth comb. nov.*

Epidendrum mooreanum Rolfe in Kew Bull. (1891) 199.

Encyclia Tonduziana Schlechter in Fedde Repert. Beihefte 19 (November 1923) 132.

Encyclia Brenesii Schlechter in Fedde Repert. Beihefte 19 (November 1923) 221.

Plant up to about 80 cm. tall (perhaps more), caespitose. Pseudobulbs ovoid or pyriform to cylindric, 2- to 4-leaved. Leaves lorate or linear-lanceolate, 18–30 cm. long, 1.4–2.3 cm. wide. Inflorescence much exceeding the leaves, simple- or compound-paniculate with short or long fractiflex branches, loosely flowered. Pedicellate ovary commonly smooth, very rarely slightly verruculose toward the summit. Flowers tend to be more fleshy than those of the other forms of this alliance and to have more

concave sepals and petals. Lateral sepals oblong-lanceolate to elliptic-lanceolate or elliptic-oblong, 12.1–15.8 mm. long, 3.1–4.9 mm. wide, subacute to sharply acute, dorsally carinate-thickened near the apex. Dorsal sepal oblong-oblanceolate or elliptic-oblanceolate, 11.8–15.8 mm. long, 3–4.9 mm. wide, obtuse to acute, more or less thickened at the apex. Petals spatulate, oblanceolate-spatulate or oblong-spatulate, 11.1–14 mm. long, 3.2–5.7 mm. wide, rounded to acute at the apex. Lip 9.9–12.9 mm. long from base of column to foremost extent of mid-lobe; lateral lobes rarely oblong-spatulate or spatulate to obovate-spatulate with the apical portion usually bulbous-dilated, commonly more or less asymmetric, sometimes very porrect when expanded, rarely lobulate, 5–6.1 mm. long on the interior margin, broadly rounded at the apex; mid-lobe suborbicular-ovate or subquadrate-ovate to suborbicular or suborbicular-quadrate, very rarely lobulate below the middle, apt to be reduplicate, 6–9.1 mm. long, 6.5–9 mm. wide, subobtuse to broadly rounded or subtruncate at the base; margin not distinctly plicate, but more or less undulate; disc much as in the typical form, veins less prominent than in the typical form though more fleshy and smooth to minutely verruculose. Column straight or nearly so, without auricles, with obscure angles or with minute sharp auricles, 5.1–7.2 mm. long.

DISTRIBUTION: Costa Rica and Panama.

Epidendrum oncidioides *Lindl.* var. **profusum** (*Rolfe*) *Ames, Hubbard & Schweinfurth comb. nov.*

Epidendrum ambiguum Lindley as misdetermined by Rolfe in Orch. Rev. 21 (1913) 215.

Epidendrum profusum Rolfe in Bot. Mag. 140 (1914) t. 8551.

Plant possibly up to 60 cm. tall, caespitose. Pseudobulbs ovoid, 2- to 3-leaved. Leaves ligulate, 18–35 cm. long, 1.5–2.5 cm. wide. Inflorescence much exceeding the leaves, paniculate. Flowers the largest of the alliance, about 4.5 cm. in diameter. Pedicellate ovary smooth. Lateral sepals elliptic-lanceolate, about 23 mm. long and 6 mm. wide, dorsally carinate near the apex, subobtuse. Dorsal sepal oblong-oblanceolate, about 23 mm. long and 5.2 mm. wide. Petals oblanceolate-spatulate, about 23 mm. long and 7 mm. wide. Lip about 18 mm. long; lateral lobes oblong-spatulate, porrect when expanded, 8.8 mm. long on the interior margin, obtuse to broadly rounded at the apex; mid-lobe suborbicular, 11.4 mm. long, 13.2 mm. wide, broadly rounded and indistinctly retuse at the apex, broadly cuneate at the base, margin throughout more or less undulate; disc much as in the typical form, veins very distinct especially the three median ones and verruculose. Column straight, with well-developed rounded auricles, 8.2 mm. long dorsally.

The foregoing description was compiled as follows: the vegetative portion from the original description by Rolfe, the floral portion chiefly from a single flower of the type.

DISTRIBUTION: Mexico (by inference).

Epidendrum oncidioides *Lindl.* var. **perplexum** *Ames, Hubbard & Schweinfurth var. nov.*

Pseudobulbus pyriformis, bifoliatus. Inflorescentia laxe paniculata. Sepala lateralia elliptico-lanceolata. Sepalum dorsale oblanceolato-oblongum. Petala oblanceolato-spathulata. Labellum profunde trilobatum; lobi laterales pandurato-oblongi, apice oblique truncati vel rotundati; lobus medius suborbicularis. Columna exauriculata.

Material fragmentary, all parts separate. Pseudobulb pyriform, 2-leaved. Leaves linear-oblong, 16.2–16.8 cm. long, up to 1 cm. wide. Inflorescence loosely paniculate, incomplete but about twice surpassing the leaves. Pedicellate ovary smooth. Flowers medium-sized. Lateral sepals elliptic-lanceolate, about 16 mm. long, 4.5–4.9 mm. wide, acute. Dorsal sepal oblanceolate-oblong, about 16 mm. long, 4.1–4.7 mm. wide, acute. Petals oblanceolate-spatulate, 15–16.5 mm. long, 4.3–4.9 mm. wide, acute. Lip 13.2–14 mm. long from base of column to tip of mid-lobe; lateral lobes oblong-pandurate, asymmetric, porrect when expanded, about 7.8 mm. long on the interior margin, obliquely truncate or rounded at the apex; mid-lobe separated from the lateral lobes by a very short but distinct isthmus, suborbicular, 8.2–9 mm. long, 9–9.5 mm. wide, slightly retuse to weakly trilobulate and apiculate at the apex, cuneate at the base; disc much as in the species except that the transition from the apically bidentate cushion-callus on the claw to the thickened veins is abrupt; veins minutely verruculose. Column without auricles, 7–7.9 mm. long dorsally.

Variety *perplexum* seems intermediate between var. *ramonense* and var. *Mooreanum*. From the former it differs in the slightly longer sepals and petals, in the rounded or slightly retuse apex of the mid-lobe of the lip and in the longer and pandurate lateral lobes. It is separable from var. *Mooreanum* by the venation of the mid-lobe of the lip and by the pandurate not spatulate lateral lobes of the lip. In texture, the flowers are thinner than those of the allied varieties. However, the most striking character which separates this variety from all other forms of the alliance is the more prominent basal sulcate callus and its abrupt transition to the veins.

Mexico, State of Vera Cruz, Zacuapan. On a tree. May 1907. *C. A. Purpus 7692* (Type in Herb. Univ. Calif. No. 198168.)

One other variety of *Epidendrum oncidioides* has been described and figured by W. Zimmermann (Bibl. Bot. Heft 109 (Orch. nov. bras.) (1934) 6): *E. oncidioides* Lindl. var. *Itabirae* W. Zimmerm. We have not seen material of this variety and from the description and drawing are unable to place it. It suggests the typical form in many respects, but tends toward var. *profusum* in other characteristics.

Brazil, Minas Geraes, Pico de Conceiçao, *Freyberg s.n.*

NOMENCLATORIAL NOTES. II.

BY

CHARLES SCHWEINFURTH

Sarcoglottis Schaffneri (*Reichb.f.*) *Ames* in Donnell-Smith Enum. Pl. Guatem. 7 (1905) 50.

Spiranthes Schaffneri Reichenbach filius in Linnaea 28 (1856) 382.

Gyrostachys Schaffneri O. Kuntze Rev. Gen. Pl. 2 (1891) 664.

Pelexia Schaffneri Schlechter in Beihefte Bot. Centralbl. 37, Abt. 2 (1920) 399.

Sarcoglottis pubilabia Ames in Sched. Orch. 2 (1923) 11.

Sarcoglottis zamororae Ames in Sched. Orch. 2 (1923) 13.

A drawing of *Spiranthes Schaffneri* recently received from the Reichenbachian Herbarium at Vienna shows beyond the shadow of a doubt that this species should include as synonyms the plants described as *Sarcoglottis pubilabia* and *Sarcoglottis zamororae*. Both of these species differ from *Spiranthes Schaffneri* in being commonly taller and always leafless at the time of blooming. However, in the type number of *Sarcoglottis pubilabia* there is one mature plant with withered floral remains at the summit of swollen ovaries which bears a cluster of very young imbricating leaf-blades appearing roughly similar in miniature to those illustrated by the scarcely expanded leaf-blades of *Spiranthes Schaffneri*. Furthermore, a recently examined Mexican specimen sent by Erik M. Östlund consists of a separate tuft of leaves said to belong to a collection which is certainly referable to *Sarcoglottis Schaffneri*. These leaf-blades (three in number) are of much the same oblong-elliptic shape as those shown by Reichenbach's drawing of *Spiranthes Schaffneri*, but are

somewhat longer and narrower than specified by the type description. The record of Reichenbach's species shows a distinctly 3-lobed lip and the other perianth organs are the exact counterpart of those of *Sarcoglottis pubilabia* and *Sarcoglottis zamororae*.

It appears that there is no justification for regarding *Sarcoglottis zamororae* as distinct from *S. pubilabia* for the lips of both species show the presence of pilose hairs on the lower part of the disc in varying distinctness. The flowers of *S. pubilabia* appear to be somewhat smaller and are denser in the upper portion of the raceme than those of *S. zamororae*.

The concept Sarcoglottis is preferred to Spiranthes because the lateral sepals are long-decurrent on the ovary unlike true Spiranthes, but they do not form a distinct spur as in the genus Pelexia.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, MAY 23, 1935 VOL. 3, NO. 8

NOMENCLATORIAL STUDIES IN MALAXIS AND SPIRANTHES

BY

OAKES AMES AND CHARLES SCHWEINFURTH

THE FOLLOWING nomenclatorial revision in Malaxis and Spiranthes was made as a result of a careful restudy of these genera based on records of types in our herbarium and particularly on a large collection of specimens from Mr. Erik M. Östlund of Cuernavaca, Morelos, Mexico.

Malaxis aurea *Ames* in Sched. Orch. 5 (1923) 3, fig. 1.

Microstylis guatemalensis Schlechter in Fedde Repert. 21 (1925) 334.

It appears that the Guatemalan *Microstylis guatemalensis* is a somewhat smaller plant vegetatively than the Costa Rican *Malaxis aurea*. However, both species were described from limited material, so the range of size cannot be estimated.

After careful comparison of the drawings, descriptions and flowers of these species (the flowers of *Microstylis guatemalensis* kindly contributed by Dr. Mansfeld), we are unable to find any differences which are in any degree diagnostic.

Malaxis brachyrrhynchos (*Reichb.f.*) *Ames* in Proc. Biol. Soc. Wash. 35 (1922) 84, as *M. brachyrrhyncha*.

Microstylis brachyrrhynchos Reichenbach filius in Flora 71 (1888) 152.

Malaxis Lankesteri Ames in Sched. Orch. 4 (1923) 7.

A rigid comparison of the type specimen of the Costa Rican *Malaxis Lankesteri* shows that it cannot well be segregated from the Mexican *Microstylis brachyrrhynchos* which is represented in our herbarium by photographs of the type and cotype and floral analyses.

Judging from the floral analyses of the type and cotype and from the numerous examples of this species in our collection, the distinctness of the apical lobing of the lip and presence of basal auricles is a variable character. The lip appears to vary from simple to obscurely trilobulate or more rarely distinctly trilobulate at the apex.

This species occurs in our herbarium from Mexico, Guatemala, Honduras and Costa Rica.

Malaxis calycina (*Lindl.*) *O. Kuntze* Rev. Gen. Pl. 2 (1891) 673.

Dienia calycina Lindley Gen. & Sp. Orch. Pl. (1830) 23.

Ophrys monophyllos Pavon in Herb. Lambert apud Lindley Gen. & Sp. Orch. Pl. (1830) 23, *in synon.*

Microstylis gracilis Ridley in Journ. Linn. Soc. 24 (1888) 321.

Microstylis calycina Ridley in Journ. Linn. Soc. 24 (1888) 331.

Serapias parasitica Pavon Mss. apud Ridley in Journ. Linn. Soc. 24 (1888) 331, *in synon.*

Microstylis monticola Schlechter in Fedde Repert. 3 (1906) 17.

Microstylis microtoides Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 381.

Malaxis monticola Ames in Proc. Biol. Soc. Wash. 35 (1922) 84.

The concept Dienia is now generally referred to the genus Microstylis or to the earlier name Malaxis.

A photograph of the type of *Microstylis gracilis* shows a plant which is somewhat smaller than that of *Dienia calycina* and with rather laxer inflorescence. However, the floral drawing of *D. calycina* by Lindley agrees well with the description of the flower of *Microstylis gracilis*. Moreover, Ames, who has examined the types of both species, describes the lip of each as "transversely elliptical." Because of the close vegetative and floral similarity between the types, it appears that they should be regarded as synonymous.

Microstylis monticola, of which we have a record of the type, is in thorough agreement both vegetatively and florally with *Dienia calycina*. In one example the lower flowers of the raceme are very loosely arranged as in the type of *Microstylis gracilis*.

A drawing of the type of *Microstylis microtoides* shows the single leaf decidedly below the middle of the stem, while in the other representatives of *Malaxis calycina* the leaf is about at the middle of the stem. The only other discrepancy from the latter species is that the dorsal sepal does not exceed the lateral sepals in size. The absence of morphological differences, however, indicates that this species is inseparable from *Malaxis calycina*.

Malaxis calycina occurs in Mexico, Guatemala and Costa Rica. It is also reported from Peru (*Pavon*) by Ridley.

Malaxis Ehrenbergii (*Reichb.f.*) *O. Kuntze* Rev. Gen. Pl. 2 (1891) 673.

Microstylis Ehrenbergii Reichenbach filius in Linnaea 22 (1849) 835.

Microstylis purpurea S. Watson in Proc. Am. Acad. 18 (1883) 195.

Microstylis porphyrea Ridley in Journ. Linn. Soc. 24 (1888) 320.
Achroanthes purpurea Greene in Pittonia 2 (Sept. 15, 1891) 184.
Malaxis porphyrea O. Kuntze Rev. Gen. Pl. 2 (Nov. 5, 1891) 673.
Malaxis purpurea O. Kuntze Rev. Gen. Pl. 2 (Nov. 5, 1891) 673.
Microstylis minutiflora Schlechter in Bull. Herb. Boiss. 7 (1899) 540.
Achroanthes porphyrea Wooton & Standley in Contrib. U.S. Nat. Herb. 16 (1913) 116.

We have recently received from Dr. R. Mansfeld of Berlin a photograph and several flowers of the type of *Microstylis minutiflora* Schltr. This species is represented by a single specimen of which the inflorescence is incomplete. However, the raceme is described as exceeding the leaf, as obviously would be the case if the inflorescence were complete. In all specimens of *Malaxis Ehrenbergii* examined by us the inflorescence much surpasses the leaf. The type of *Microstylis minutiflora* shows a leaf which might be described as elliptic-oblong and is somewhat longer and narrower in proportion than is usually the case in *Malaxis Ehrenbergii*. The flowers of *Microstylis minutiflora*, however, are in almost perfect agreement with those of *Malaxis Ehrenbergii*, although perhaps a trifle smaller.

From these considerations, therefore, it appears to us wise to regard *Microstylis minutiflora* as conspecific with *Malaxis Ehrenbergii*.

This species extends from Arizona and New Mexico through Mexico to Guatemala.

Malaxis fastigiata (*Reichb.f.*) *O. Kuntze* Rev. Gen. Pl. 2 (1891) 673.

Microstylis ophioglossoides Nutt. *β. mexicana* Lindley in Bot. Reg. 15 (1829) t. 1290, quoad tabellam ex parte.
Malaxis maianthemifolia A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 18, non Schlecht. & Cham. (1831).
Dienia majanthemifolia Reichenbach filius in Linnaea 19 (1847) 369.
Microstylis fastigiata Reichenbach filius in Linnaea 22 (1849) 834.
Ophrys ensifolia Pavon Mss. apud Ridley in Journ. Linn. Soc. 24 (March 1888) 326, *in synon.*
Microstylis longisepala Ridley in Journ. Linn. Soc. 24 (March 1888) 327.
Microstylis linguella Reichenbach filius in Flora 71 (April 1888) 153.
Malaxis longisepala O. Kuntze Rev. Gen. Pl. 2 (1891) 673.
Malaxis linguella Ames in Proc. Biol. Soc. Wash. 35 (1922) 84.

As Dr. Ridley points out in his monograph of Microstylis (Journ. Linn. Soc. 24 (1888) 326), the figures in the Botanical Register (t. 1290) of the complete plant and also of the flowering scape represent *Malaxis fastigiata* and not *M. ophioglossoides.* Reichenbach proposed the name *fastigiata* as a substitute for the descriptive *maianthemifolia* which was invalidated by its earlier use for another plant.

The concept, *Microstylis longisepala*, was erected by Ridley to describe a plant which he says is "Very near *M. fastigiata*, especially the form collected by Pavon, but the flowers are larger, and the longer sepals are very conspicuous." However, a record of the type of *Microstylis longisepala* in our herbarium shows a plant which exactly agrees with some specimens of *M. fastigiata.*

Moreover, a floral analysis of *Malaxis maianthemifolia* A. Rich. & Gal., which is the type of *Myerostylis fastigiata* Reichb. f., shows a lateral sepal which conspicuously surpasses the lip, as in *Microstylis longisepala*. Indeed, it would seem to us that the degree of superiority of one organ over another, if of limited extent, is scarcely a logical basis for specific separation in a variable genus.

A record of the type of *Microstylis linguella* does not show any characters to separate it from *Malaxis fastigiata*. Like the typical form of *Malaxis fastigiata*, this species has a linear-lanceolate rostriform termination to the lip. Judging from Reichenbach's analysis of the species, it has rather narrowly lanceolate sepals.

Altogether *Malaxis fastigiata* appears to be an extremely variable species. The most striking points of variation are the size, the presence of one or two leaves on the stem, the narrowed-clasping or cordate base of the leaf and the degree of acumination of the lip.

The species extends through Mexico, Guatemala and Honduras to Bolivia, as well as to Santa Martha [Colombia] fide Ridley.

Malaxis hastilabia (*Reichb. f.*) *O. Kuntze* Rev. Gen. Pl. 2 (1891) 673.

Microstylis hastilabia Reichenbach filius Beitr. Orch. Centr.-Am. (1866) 101.

Malaxis uncinata Ames & Schweinfurth in Sched. Orch. 10 (1930) 15.

The Costa Rican *Malaxis uncinata* was separated from the Costa Rican *Microstylis hastilabia* by the presence of uncinate basal auricles of the lip. However, the recent receipt from the Reichenbachian Herbarium of a floral analysis which represents Reichenbach's conception of the flower of *Microstylis hastilabia* shows that these basal auricles approach too nearly those of *Malaxis un-*

cinata. While they are not truly uncinate, as in most examples of *Malaxis uncinata*, these basal auricles appear somewhat diverse in shape varying from broadly triangular to linear or linear-triangular and curved forward. One flower of a Costa Rican collection of so-called *Microstylis hastilabia* (*Brenes 32*) shows a lip with one basal auricle uncinate, and the other wide-spreading slightly curved and sigmoid near the apex. It appears, therefore, that the basal auricles are variable in shape, all the more so because those of specimens from South America are almost straight and little spreading.

The type of *Malaxis uncinata* appears to agree very well in size and character with Ridley's description of *Microstylis hastilabia* in his monograph of the genus (Journ. Linn. Soc. 24 (1888) 325).

Malaxis hastilabia is a Costa Rican species, but is also reported (or specimens have been seen) from Guatemala, Colombia, British Guiana, Brazil and Peru.

Malaxis Javesiae (*Reichb.f.*) *Ames* in Proc. Biol. Soc. Wash. 35 (1922) 84.

Microstylis Javesiae Reichenbach filius in Flora 71 (1888) 152.

Malaxis mexicana Ames in Proc. Biol. Soc. Wash. 35 (1922) 82.

The only notable difference between the above concepts is that *Malaxis Javesiae* appears to be uniformly monophyllous, while the single specimen that comprises the type of *M. mexicana* is diphyllous. However, the presence of one or two subopposite leaves in the genus Malaxis is of extremely variable occurrence in representatives of one species, and the character can scarcely have diagnostic weight. The stem of *Malaxis mexicana* appears to be stouter than that of *M. Javesiae*.

This species is known to occur only in Mexico.

Malaxis lepidota (*Finet*) *Ames* in Proc. Biol. Soc. Wash. 35 (1922) 84.

Microstylis lepidota Finet in Bull. Soc. Bot. Fr. 54 (1907) 531, t. 11, figs. 1–7.

Malaxis macrantha Ames Orch. 2 (1908) 263, text cut.

A comparison of the types of these species shows that they are essentially identical. In *M. macrantha* all parts of the perianth appear to be somewhat broader than in *M. lepidota* The epidermal emergences attributed to the inner surface of the sepals and petals of *Microstylis lepidota* appear to be a highly variable character, sometimes being manifest only along the veins or not at all.

This species occurs in Mexico and Honduras.

Malaxis macrostachya (*La Llave & Lex.*) *O. Kuntze* Rev. Gen. Pl. 2 (1891) 673.

Ophris macrostachya La Llave & Lexarza Nov. Veg. Descr. 2 (1825) (Orch. Opusc.) 9.

Microstylis macrostachya Lindley Gen. & Sp. Orch. Pl. (1830) 21.

Microstylis montana Engelmann apud Rothrock in Wheeler Rept. U. S. Geogr. Surv. W. 100th Merid. 6 Bot. (1878) 264.

Malaxis densiflora A. Richard & Galeotti Mss. apud Ridley in Journ. Linn Soc. 24 (1888) 331.

Achroanthes montana Greene in Pittonia 2 (Sept. 15, 1891) 183.

Malaxis montana O. Kuntze Rev. Gen. Pl. 2 (Nov. 5, 1891) 673, non Blume.

Malaxis Soulei L. Williams in Ann. Mo. Bot. Gard. 21 (1934) 343.

La Llave and Lexarza in their typically indefinite description of *Ophris macrostachya* make no mention of the retuse or lobulate apex of the lip, and Lindley in his

reduction of the species to Microstylis merely quotes the earlier description. However, (in Bentham Pl. Hartweg. (1845) 52) Lindley cites as *Microstylis macrostachya* a collection of which we have a photograph with a floral analysis (apparently made by Finet). In this drawing the round-ovate lip is shown to be sharply retuse at the apex with the disc concave in the centre. There is indicated also the presence of a little tooth just below the retuse apex which usually becomes, at least in herbarium specimens, a more or less prominent lobule in the centre of the retuse apex. In a large number of collections examined the development and consequent prominence of the little tooth appears to vary. Ridley, in his monograph of Microstylis (Journ. Linn. Soc. 24 (1888) 316), separates *Microstylis macrostachya* from *M. montana* by the following characteristic—"Labellum apice bilobo . . . *macrostachya*. Labellum apice trilobo, lobo mediano minuto. . . *montana*." However, Rothrock says, in his description of *Microstylis montana*, "lip. . . obtuse or occasionally notched at apex." In the flowers from the type of *Microstylis montana* examined the lip appears always to be retuse with the central tooth relatively inconspicuous.

The separation of *Microstylis montana* from *Malaxis macrostachya*, therefore, would not seem reasonable.

This species appears to be variable in size, in having usually a single leaf but rarely two leaves, and in the lobing of the lip.

It extends from Arizona through Mexico to Costa Rica (small form).

Malaxis majanthemifolia *Schlechtendahl & Chamisso* in Linnaea 6 (1831) 59.

Malaxis ichthiorhynca A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 18.

Malaxis cochleariaefolia A. Richard & Galeotti in

Ann. Sci. Nat. ser. 3, 3 (1845) 18.
Microstylis cochleariaefolia Reichenbach filius in Linnaea 22 (1849) 834.
Microstylis majanthemifolia Reichenbach filius in Linnaea 22 (1849) 834.
Microstylis ichthyorrhyncha Reichenbach filius Beitr. Orch. Centr.-Am. (1866) 99.
Achroanthes maianthemifolia Greene in Pittonia 2 (Sept. 15, 1891) 184.
Microstylis elegantula Schlechter in Fedde Repert. 3 (1906) 17.

In our herbarium is a copy of a sketch (from the Reichenbachian Herbarium at Vienna) of the type of *Malaxis majanthemifolia* Schlecht. & Cham. with an analysis of its flower as well as a similar record of *Malaxis ichthiorhynca*. The only difference between the two species is that the lip of *Malaxis majanthemifolia* is drawn as shortly but distinctly unguiculate and the disc does not show any concavity or depression, while the lip of *Malaxis ichthiorhyncha* is shown (and described) as sessile with a large concavity in the lower portion. Both species, however, have a lip of the same form even to the auriculate base and the concavity might readily be omitted from a drawing. Otherwise the floral parts are as similar as could be expected from different plants and the vegetative proportions (as amplified by the description of *Malaxis majanthemifolia*) are nearly identical. Altogether, therefore, it appears to us thoroughly justifiable to regard the species as synonymous.

Malaxis cochleariaefolia is apparently unrepresented at the Muséum d'Histoire Naturelle in Paris which is the repository of the Richard and Galeotti plants; but from the brief description the species appears to be synonymous with *Malaxis ichthiorhynca* and has been so regarded by Ridley in his monograph of Microstylis (Journ.

Linn. Soc. 24 (1888) 319).

Microstylis elegantula, of which we have a duplicate type, appears to be only a larger form of *Malaxis majanthemifolia* which seems to be a species of the greatest variability in size. One collection from Guatemala(*Türckheim II 1992*) contains one plant which is only about 6.5 cm. tall with proportionally small leaves and flowers, while the type of *Microstylis elegantula* sometimes reaches 40 cm.in height. Sometimes, as in the Guatemalan collection cited and in specimens from Honduras, the lip is relatively shorter than typical with longer basal auricles and rather broader petals.

Malaxis majanthemifolia extends from Mexico through Guatemala to Honduras.

Malaxis pandurata (*Schltr.*) *Ames* in Proc. Biol. Soc. Wash. 35 (1922) 84.

Microstylis pandurata Schlechter in Fedde Repert. 3 (1906) 77.

Microstylis Türckheimii Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 382.

Malaxis Tuerckheimii Ames in Proc. Biol. Soc. Wash. 35 (1922) 85.

Careful comparison of the drawings and descriptions of these species supplemented by flowers from the types, kindly sent by Dr. Mansfeld, convince us that they should be regarded as synonymous. Indeed the only differences between them appear to be the somewhat narrower leaves and more prominent central thickening through the disc of the lip of *Malaxis pandurata*. These characters, however, are transitional and consequently are surely not of diagnostic weight.

This species occurs in Guatemala and Costa Rica.

Malaxis Parthonii *Morren* in Bull. Acad. Roy... de Belge 5 (1838) 485, t.

Microstylis histionantha Link, Klotzsch & Otto Icon. Pl. Rar. Hort....Berol. 1 (1841) 11, t. 5.
Microstylis Parthoni Reichenbach filius in Walp. Ann. 6 (1861) 206.
Microstylis Brenesii Schlechter in Fedde Repert. Beihefte 19 (1923) 167.

The lip of *Malaxis Parthonii*, as depicted by Morren, is surely narrower in form than that of *Microstylis histionantha* as figured by Link, Klotzsch and Otto or by Hooker in Botanical Magazine 70 (1844) t. 4103. However, authors of the high standing of Cogniaux and Ridley (the latter in his monograph of the genus) consider the two species as synonymous. Moreover, we have examined a large series of specimens in which the lips, even in one collection, vary from broadly ovate to suborbicular or even transversely round-elliptic.

Microstylis Brenesii is supposed to differ from the allied species in its smaller habit, sharper leaves, smaller flowers and the form of the lip. However, a drawing of the type of this species in our herbarium shows a leaf very similar in shape to that of *Malaxis Parthonii* and *Microstylis histionantha*. As shown by a floral analysis of Schlechter's species, the lip varies (perhaps due to spreading) from round-ovate to transversely round-oval and is in no sense subreniform-flabellate as Schlechter describes it. At least in one of the lips shown, there appears to be a basal depression (as in *Malaxis Parthonii*). The vegetative size of plant and flowers certainly is scarcely diagnostic in this genus.

Malaxis Parthonii appears to extend from Mexico, through Central America to Costa Rica and also occurs in Colombia, Venezuela, Brazil and Peru.

Malaxis Reichei (*Schltr.*) *Ames & Schweinfurth comb. nov.*

Microstylis Reichei Schlechter in Fedde Repert. 21 (1925) 335.

In accordance with the law of priority, this species must be transferred to the earlier generic name Malaxis.

Recently we have received from Erik M. Östlund of Cuernavaca, Mexico, a single specimen which appears to be referable to this species. It agrees well with the habit and analytical drawings of the type in our herbarium and with the description, slight discrepancies appearing in the obtuse (not acute or acuminate) leaves which are slightly below the middle of the stem and in the narrower basal part of the lip. The specimen was collected under oaks on rocky mountain slopes in Guerrero, near the Cuernavaca-Taxco Road (Km. 156) at about 1,650 meters altitude by Otto Nagel (*Östlund 1155*) on August 10, 1932.

This species is closely allied to *Malaxis fastigiata* (Reichb.f.) O. Ktze. and may prove to be reducible to that species when more material is available for comparison. It appears, however, to differ from that species in its abrupt terminal ovate-oblong lobe of the lip and in the presence of a more or less distinct though small point on either side of the base of the middle lobe.

Malaxis unifolia *Michaux* Fl. Bor.-am. 2 (1803) 157.

Malaxis ophioglossoides Muhlenberg ex Willdenow Sp. Pl. 4 (1805) 90, *in synon.*
Achroanthes unifolia Rafinesque in Med. Repos. N.Y. Hex. 2, 5 (1808) 352.
Microstylis ophioglossoides Nuttall Gen. No. Am. Pl. 2 (1818) 196, sub Malaxis, as subgenus—apud A. Eaton Man. Bot. No. & Mid. States ed. 3 (1822) 353, *Microstylis ophioglossoides* Nutt. *β. mexicana* Lindley in Bot. Reg. 15 (1829) t. 1290, pro parte et textu.

Malaxis thlaspiformis A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 18.

Microstylis unifolia Britton, Sterns & Poggenberg Prelim. Cat. Anthoph. & Pterid. N. Y. (1888) 51.

Microstylis Grisebachiana Fawcett & Rendle in Journ. Bot. 47 (1909) 7.

Malaxis Grisebachiana Fawcett & Rendle Fl. Jam. 1 (1910) 43, t. 6, figs. 18-23.

A photograph and a sketch with floral analysis of *Malaxis thlaspiformis* in our herbarium show that this species represents merely a vegetatively enlarged form of the widespread North American *Malaxis unifolia*. According to the drawing, however, the lip of *M. thlaspiformis* appears to be markedly shorter than the lateral sepals while in all the specimens of *M. unifolia* examined the lip subequals or surpasses the sepals.

Malaxis Grisebachiana, as described and figured by Fawcett and Rendle, depends for its separation from *M. unifolia* on "the auriculate, not cordate, lip, and the position of the leaf nearer the base of the stem." However, we fail to distinguish any difference between the terms auriculate and cordate, as applied to the lip. Certainly we could see no difference in the flower of *M. Grisebachiana* examined from that of the typical *M. unifolia*. Moreover, the position of the leaf is extremely variable in *Malaxis unifolia*: specimens from Newfoundland (*Fernald & Wiegand 3141, 3246*) show the leaf about as near the base of the plant as in some specimens of *M. Grisebachiana* from Jamaica cited by Fawcett and Rendle. On the other hand, frequent collections from the mainland of North America have the leaf considerably above the middle of the stem. Thus it would appear to us that the position of the leaf is not diagnostically important or worthy of specific recognition.

Malaxis unifolia occurs in North America from Newfoundland west to Manitoba and locally south to Kentucky, Georgia and Illinois; also found in Mexico, Cuba and Jamaica.

Spiranthes cinnabarina (*La Llave & Lex.*) *Hemsley* in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1884) 300.

Neottia cinnabarina La Llave & Lexarza Nov. Veg. Descr. 2 (1825) (Orch. Opusc.) 3.
Stenorhynchus cinnabarinus Lindley Gen. & Sp. Orch. Pl. (1840) 479; in Bot. Reg. 33 (1847) t. 65.
Stenorrhynchus montanus Lindley in Bentham Pl. Hartweg. (1842) 95.
Spiranthes montana Hemsley in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1884) 301.
Gyrostachys cinnabarina O. Kuntze Rev. Gen. Pl. 2 (1891) 664.
Gyrostachys montana O. Kuntze Rev. Gen. Pl. 2 (1891) 664.

A careful comparison of the type description of *Neottia cinnabarina* (supplemented by the plate of *Stenorrhynchus cinnabarinus* in the Botanical Register) with a photograph of the type of *Stenorrhynchus montanus* (which bears a drawing of the lip) leaves no doubt that the plants are conspecific. The only discrepancy noticeable is that the lip of *Stenorrhynchus montanus* shows a somewhat obovate dilation in the middle, while the lip of *Stenorrhynchus cinnabarinus* is represented (Bot. Reg. 33, t. 65) as having an elliptical dilation below the middle. However, this character is seen to vary in specimens examined.

The lack of a definite spur-like mentum indicates that this species should be classed with the genus Spiranthes.

This species appears to be limited to Mexico and Guatemala.

Spiranthes durangensis *Ames & Schweinfurth nom. nov.*

Spiranthes saltensis Ames Orch. 2 (1908) 258; Orch. 3 (1909) 72, t. 51, non Grisebach (1879).
Schiedeella saltensis Schlechter in Beihefte Bot. Centralbl. 37, Abt. 2 (1920) 381.

Due to the earlier use of the combination, *Spiranthes saltensis* by Grisebach in 1879, its use by Ames in 1908 is invalid. Therefore we propose the new name as cited above, alluding to the Mexican state where this species was originally discovered.

A Mexican species which has also been discovered in the Chisos Mountains of Texas.

Spiranthes michuacana (*La Llave & Lex.*) *Hemsley* in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1884) 301, as *mechoacana.*

Neottia michuacana La Lave & Lexarza Nov. Veg. Descr. 2 (1825) (Orch. Opusc.) 3.
Neottia sulphurea La Llave & Lexarza Nov. Veg. Descr. 2 (1825) (Orch. Opusc.) 4.
Stenorhynchus sulphureus Lindley Gen. & Sp. Orch. Pl. (1840) 478.
Stenorhynchus Michuacanus Lindley Gen. & Sp. Orch. Pl. (1840) 480.
Stenorrhynchus Madrensis Reichenbach filius in Bonpl. 3 (1855) 177.
Spiranthes madrensis Hemsley in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1884) 301.
Spiranthes sulphurea Hemsley in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1884) 302.
Gyrostachys madrensis O. Kuntze Rev. Gen. Pl. 2 (1891) 664.

Gyrostachys sulfurea O. Kuntze Rev. Gen. Pl. 2 (1891) 664.
Spiranthes bracteolaris Kränzlin in Arkiv Bot. 14 (1915) 7.

A careful comparison of the descriptions of *Neottia michuacana* and *N.sulphurea* shows that the former is a slightly taller plant having cauline leaves as well as the strictly basal leaves of *N.sulphurea*. The only other differences appear to be a matter of degree and are trivial.

We are inclined to refer this species to the genus Spiranthes rather than to Stenorrhynchus since the mentum formed by the lateral sepals with the foot of the column is not distinct nor prominent, whereas we rely chiefly on the prominent mentum for the distinctness of Stenorrhynchus.

Stenorrhynchus madrensis depends chiefly for its separation from *Neottia sulphurea* (with which it is compared) on its quaquaversal (not secund) raceme, and its not urceolate perianth. A photograph of the type plant of *Stenorrhynchus madrensis*, however, shows the perianth of mature flowers distinctly urceolate with ringent apices of the segments, as described in *Neottia sulphurea* and *N.michuacana*. The raceme is not secund in any sense, but the secund or quaquaversal arrangement of dense racemes is a character which is certainly not of specific weight in the genus Spiranthes (both forms occurring in the widely dispersed *Spiranthes gracilis* (Bigel.) Beck). The lip of *Stenorrhynchus madrensis* is described as pandurate, but the slight constriction above the centre of the lip is seen to be a variable character in plants referred to that species.

Spiranthes bracteolaris Kränzl., of which we have examined the type number, has the ensiform or narrowly lanceolate basal and cauline leaves of *Neottia michuacana* and appears otherwise to agree well with that species ex-

cept that its floral bracts distinctly surpass the flowers instead of equalling them. The racemes of *Spiranthes bracteolaris* are described as secund, but they might better be termed quaquaversal with a secund tendency. A strange coincidence in connection with the two forms is that *N. michuacana* is described as "planta odoratissima" and that *Spiranthes bracteolaris* has strongly fragrant vegetative parts in the dried type specimen twenty-five years after it was collected! Like *Neottia michuacana*, this species blooms in the state of Michuacán in October.

Spiranthes michuacana appears to be widely distributed in Mexico.

Spiranthes minutiflora *A. Richard & Galeotti* in Comptes Rend. Acad. Sci. Par. 18 (1844) 513, *nomen*; in Ann. Sci. Nat. ser. 3, 3 (1845) 32.

Spiranthes nutantiflora Schlechter in Fedde Repert. 2 (1906) 131.

Mesadenus minutiflorus Schlechter in Beihefte Bot. Centralbl. 37, Abt. 2 (1920) 368.

In 1920, the late Dr. Schlechter in his monograph of the Spiranthinae (Beihefte Bot. Centralbl. 37, Abt. 2 (1920)) created many new genera for species traditionally regarded as representatives of Spiranthes. Most of these, if not all of them, are based on recondite characters of the column and pollinia and are not readily observable. Among these genera is the concept Mesadenus which we consider best relegated to the synonymy of Spiranthes.

A series of specimens from Hidalgo and Distrito Federal, Mexico, recently sent by Erik M. Östlund are surely referable to *S. minutiflora*. They show a general similarity to each other, but embrace a rather wide range of vegetative characters, since they vary from about 8.5 20 cm. in height and most (but not all) of them show at their base withered remains of oblong-elliptical long-peti-

oled leaves. The flowers of these plants show a more or less distinct constriction toward the apex of the lip to form an apical suborbicular lobule, but this constriction is really very slight. These specimens were collected in March at about 2,500 to 2,900 meters altitude.

The type of *S. minutiflora* was obtained at Chiapas, Mexico, at about 6,600 feet altitude. It is a leafless plant about 23 cm. tall, but does not include any root-system such as the fleshy ellipsoid tubers of the Ostlund specimens. It has, however, the racemes of similarly loosely disposed flowers. No constriction of the anterior margin of the lip is described or indicated in Galeotti's drawing from the type specimen of *S. minutiflora*. However, the flowers of the Galeotti plant, like those of the Östlund specimens, are distinctly mature (with swollen ovaries) and the constriction might not be evident.

Spiranthes nutantiflora originated from Guatemala, but very near to the Mexican type locality of *S. minutiflora*. It is a plant about 6 cm. high and the raceme is described as subdense. The drawing of its lip shows a distinct anterior constriction forming a suborbicular apical lobe. It was found blooming in November at about 3,000 meters altitude. The somewhat greater altitude, earlier (seasonal) time of bloom, and the less mature flowers would easily account for the dwarf habit and dense inflorescence of this form.

Specimens from Costa Rica, which are referred to *S. nutantiflora*, range from about 9.5–22 cm. in height and show for the most part a few basal elliptical or oblong-elliptical long-petioled leaves in a more or less well-preserved condition. They were collected from December 29 to January 1 at 2,600 to 3,000 meters altitude. In these flowers, the anterior constriction of the lip is somewhat indistinct.

It is therefore evident that the height of the plant,

the presence or absence of basal leaves and the conspicuousness of the anterior constriction of the lip are variable and consequently unreliable characters, and it would appear that we are concerned with a single species extending from southern Mexico to Costa Rica.

Spiranthes polyantha *Reichenbach filius* in Linnaea 18 (1844) 408.

Spiranthes Galeottiana A. Richard & Galeotti in Comptes Rend. Acad. Sci. Par. 18 (1844) 509, 513, *nomen*; in Ann. Sci. Nat. ser. 3, 3 (1845) 32.
Gyrostachys polyantha O. Kuntze Rev. Gen. Pl. 2 (1891) 664.
Ibidium lucayanum Britton in Bull. N. Y. Bot. Gard. 5 (February 1909) 312.
Spiranthes lucayana Cogniaux in Urban Symb. Antill. 6 (December 1909) 338.
Mesadenus Galeottianus Schlechter in Beihefte Bot. Centralbl. 37, Abt. 2 (1920) 368.
Mesadenus lucayanus Schlechter in Beihefte Bot. Centralbl. 37, Abt. 2 (1920) 368.
Mesadenus polyanthus Schlechter in Beihefte Bot. Centralbl. 37, Abt. 2 (1920) 369.

We have recently received from the Reichenbachian herbarium in Vienna a habit drawing with floral analysis of *Spiranthes polyantha* collected at Oaxaca by Galeotti. While the type of the species was noted as "Chapultepac... Leibold", the only specimen of *S. polyantha* extant in the personal herbarium of Reichenbach is the Oaxaca collection cited above. This record appears to be in nearly exact agreement with a specimen of *S. Galeottiana* collected by Galeotti at Oaxaca preserved in the Muséum d'Histoire Naturelle at Paris—a specimen which may reasonably be regarded as the type of *S. Galeottiana*.

In a photographic record and in the very brief de-

scription of *S. Galeottiana*, the leaves are noted as long-petioled and the flowers are described as purple, while in *S. polyantha* the leaves are drawn as relatively short-petioled and the flowers are described as apparently white. However, these discrepancies may be regarded as minor differences when compared with the striking similarity between the species both from the records of the authentic material in our collection and from the type descriptions.

Ibidium lucayanum, of which we have type material, differs somewhat from *S. polyantha* in the form of the lip. This segment might be described as lanceolate-elliptic and distinctly narrowed at each end. The lip of *S. polyantha* is more truly lanceolate, less narrowed at the base and more attenuate toward the tip. In a large series of specimens examined, however, the form of the lip was seen to vary as to the degree of narrowing at base and apex. No other morphological differences between *Ibidium lucayanum* and *Spiranthes polyantha* were noted.

The generic name Spiranthes is conserved over Salisbury's Ibidium and Persoon's Gyrostachis.

Spiranthes polyantha has appeared in the hammocks of southern Florida, in Mexico from numerous stations, as well as in the Bahama Islands, Santo Domingo and Porto Rico.

STUDIES IN STELIS. IV.

BY

OAKES AMES

Stelis pardipes *Reichenbach filius* Beitr. Orch. Centr.-Am. (1866) 96 — Hemsl. in Gard. Chron. n.s. 12 (1879) 108 — Hemsl. in Godm. & Salv. Biol. Centr-Am. Bot. 3 (1883) 204 — Pittier in Anal. Mus. Nac. Costa Rica 1 (1887) 73 — Schltr. in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 446: in Fedde Repert. Beihefte 19 (1923) 18, 97, 175.

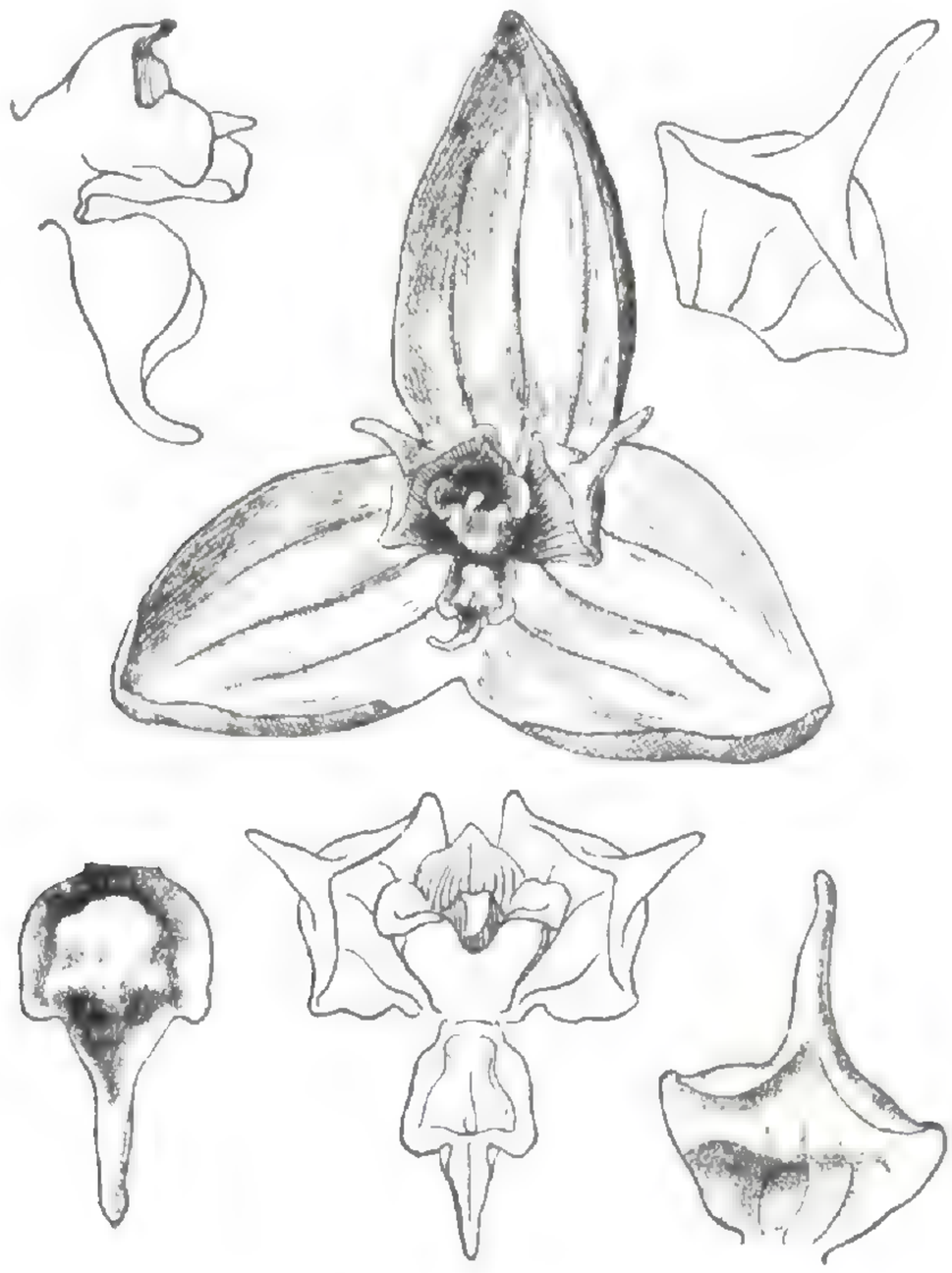
Stelis longicuspis Schlechter in Fedde Repert. 9 (1910) 28; 10 (1912) 291, *in nota.*

Stelis Alberti Schlechter in Fedde Repert. Beihefte 19 (1923) 170.

This species has appeared again and again in collections made in Costa Rica. It is a very common species there, but is unknown elsewhere in Middle America, although it has been found in Peru. When Dr. Schlechter published his *Stelis longicuspis*, he was unfamiliar with authentic material of Reichenbach's *S. pardipes*. In Fedde Repertorium 10 (1912) 291 he reduced *S. longicuspis* to synonymy. Later he published *S. Alberti*, distinguishing it from *S. pardipes* chiefly through the tubular bracts of the secondary stems being without the maculations that characterize typical *S. pardipes*. In my opinion *S. Alberti* is simply a form of *S. pardipes*, agreeing with it in the structure of the flower.

The accompanying illustration was made in part from a flower of Reichenbach's type specimen and in part from Standley 50059, the figures at lower left and right having been drawn from a labellum and petal of Standley's collection. In living specimens the petals and labellum are directed forward, their tips being more or less convergent, and the lateral sepals are more or less

coherent forming a rounded cup. In the drawing of the flower the lateral sepals were forced apart to show their outline and to reveal the petals, labellum and column. The flowers vary markedly in size, the sepals of the type being about 3 mm. long and in some of the more luxuriant forms being twice that length. In *S. pardipes* the flowers are so distinctive that there is no likelihood of confusing it with any other known Stelis. The column has stigmatiferous lateral lobes.



Costa Rica, Desengaño. September 5, 1857. *Wendland 899* (Type of *S. pardipes*); San Pedro de San Ramon. At 1,150 meters altitude. September 1921. *A. M. Brenes 118* (Type of *S. Alberti*); La Palma. At 1,459 meters altitude. September 27, 1898. *A. Tonduz 12650* (Type of *S. longicuspis*).

Peru, Department of Junin, Pichis Trail, Dos de Mayo. At 1,700–1,900 meters altitude. Dense forest. July 2 and 3, 1929. *E. P. Killip & A. C. Smith 25806* and *25883*: Department of Ayacucho, Aina, between Haunta and Rio Apurimac. At 750–1,000 meters altitude. Dense forest. May 7 and 17, 1929. *E. P. Killip & A. C. Smith 22773* (U. S. Nat. Herb. 1357643 in part).

NOMENCLATORIAL NOTES. III.

BY

CHARLES SCHWEINFURTH

Maxillaria crassifolia *Reichenbach filius* in Bonpl. 2 (1854) 16.

Epidendrum sessile Swartz Prodr. Veg. Ind. Occ. (1788) 122, non *Maxillaria sessilis* Lindl. (1845).

Heterotaxis crassifolia Lindley in Bot. Reg. 12 (1826) t. 1028.

Dicrypta Baueri Lindley Gen. & Sp. Orch. Pl. (1830) 44, (1832) 152—Bauer & Lindley Ill. Orch. Pl., Gen. (1833) t. 5.

Maxillaria sessilis Fawcett & Rendle Fl. Jam. 1 (1910) 120, non Lindley (1845).

Maxillaria gatunensis Schlechter in Fedde Repert. Beihefte 17 (1922) 68.

Owing to the prior use of the name *Maxillaria sessilis* by Lindley in 1845, for quite a different species, its later use by Fawcett and Rendle is invalid.

In the description of the Panamanian *M. gatunensis*, its separation from *M. crassifolia* was based on its somewhat larger brighter-colored flowers, broader petals and distinctly 3-lobed densely short-papillose lip.

However, we have examined a blossoming specimen distributed as the type number of *M. gatunensis* and this plant shows flowers scarcely to be distinguished in size, degree of lobing of the lip or papillose character of the disc from typical examples of *M. crassifolia* from Costa Rica, Cuba and Brazil. While the description of *M. gatunensis* gives the length of the sepals as about 2 cm., our example of the type number shows sepals 1.5 1.6 cm. long. The color of *M. crassifolia* is a variable and thus unreliable character.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, JUNE 29, 1935 VOL. 3, NO. 9

PERMIAN ELEMENTS IN THE FOSSIL FLORA OF THE APPALACHIAN PROVINCE. I. TAENIOPTERIS

BY

WILLIAM C. DARRAH

INTRODUCTION

THE LATE DOCTOR DAVID WHITE studied the floras of supposed Permian age in Pennsylvania and West Virginia for more than thirty years. His observations[1] essentially substantiated those of Fontaine and I. C. White[2] who published the only comprehensive survey of the flora of the Dunkard Group. This fossil flora contains a complex intermingling of Carboniferous, Permian and "Triassic" plants. More precisely the last group are plants of "Mesozoic implication." Most investigators have followed the conclusions of David White and of Fontaine and White, and have regarded the Dunkard rocks to be of Permian age. That there is a true Permian flora in the Dunkard is incontestably demonstrated by the presence of Callipteris. However, this important indicator makes its appearance at the base of the Greene or Upper Dunkard. In a strict sense the Permian division-

[1] Bull. Geol. Soc. Am. vol. 14. pp. 538-540. 1904

[2] Permian Flora; Harrisburg 1883

line begins at this appearance.[3]

The Washington or Lower Dunkard is considered to be Pennsylvanian or Upper Carboniferous and the fossil flora of the Washington admits no other correlation.[4] The most significant plant forms discovered in the Dunkard include Taeniopteris, Baiera, Callipteris and Sapportea. No specimens of these forms were known to exist because Fontaine's collections were destroyed by fire. There is some reason to believe these may be rediscovered in old collections. In recent collections I have been able to find not only Taeniopteris, Baiera and Callipteris, but also Walchia and Lescuropteris. Of these genera, Callipteris alone is considered to be a certain Permian indicator.

I propose to present several short notices to establish the status of these plants in the fossil floras of the Appalachian province. These "cosmopolitan" forms (except Lescuropteris) are among the most important late Paleozoic plants known to paleobotanists.

TAENIOPTERIS

Taeniopteris[5] is a frond-genus including diverse plants. Some of the "species" are ferns of Marattiaceous affinities, although the majority are cycadophytes. In the absence of convincing evidence based upon fructifications, it is unwarranted to sort out the forms. It is usually assumed that the Paleozoic species are ferns or seed-ferns, and the Mesozoic species are Bennettitalean. The name Macrotaeniopteris has been used to designate the Mesozoic forms, but since a number are of diminutive size, considerable objection has been raised against

[3] Darrah 1934 Proc. Geol. Soc. Am. (1933) p. 451
[4] Darrah 1935 Summaries of Papers for Carb. Congress pp. 1-8
[5] See Seward 1910. Foss Pls. vol. 2. pp. 485-494

such usage. The generic concept of Taeniopteris was formulated by Brongniart[6] and the type of the genus is *Taeniopteris vittata* Brongniart. The description of a number of species since the work of Brongniart has extended the concept to include petiolate leaves and bipinnate fronds. The propriety of this inclusive interpretation is open to criticism.

A score of Paleozoic Taeniopterids have been described. The so-called "species" are poorly defined, although five specific alliances are easily recognized. All of them are characteristic of the Permian, despite the fact that a number of pre-Permian occurrences have been reported. Together they possess a broad northern-hemisphere distribution usually considered as "cosmopolitan." Taeniopteris, in its broadest sense ranges from the Upper Carboniferous to Lower Cretaceous (or Neocomian).

The specimen reported in this paper was found in the roof-shales of the Uniontown Coal, Monongahela Group (Upper Carboniferous) at Monongahela City, Fayette County, Pennsylvania. The specimen is number 12455 in the Paleobotanical Collection of the Botanical Museum of Harvard University. Collected by Darrah, November 1933. Two impressions of a Taeniopteris are preserved in the dark gray, fine-grained shale. They are of a single species which conforms to *Taeniopteris jejunata* Grand' Eury, and present no character upon which a specific separation may be based. Grand' Eury's plant is relatively abundant in the Stephanian and Rotliegende of France, Germany, Spain and Czechoslovakia. The specimen also bears a relation to *Taeniopteris lesquereuxiana* Fontaine & I. C. White. This form,[7] together with a second,[8] *T. newberriana* was described from material col-

[6] 1828 Prodr. p. 61; Hist. veg. foss. I. p. 262
[7] Penn. Flora. p. 91. pl. 34. fig. 9, 9a
[8] Ibid. p. 91. pl. 34. fig. 1-8

lected from the Waynesburg Coal, Washington Group (Lower Dunkard) at Cassville, West Virginia.

An unfortunate confusion has been caused in Europe as a result of a citation by Potonie[9] who referred "*T. neuberryana*" ex parte to *T. jejunata* and cited pl. 34 fig. 9, 9a in the synonymy. This is a misstatement as Sellards recognized in 1900,[10] because the figures refer to *T. lesquereuxiana* not *T. neuberriana*. *Taeniopteris neuberriana* belongs to the group of *T. coriacea* Goeppert a relationship which Fontaine and White recognized. They suggested that *T. lesquereuxiana* was a member of the *T. multinervis* group. This reference is more trivial than is apparent, because *T. jejunata* differs from *T. multinervis* Weiss chiefly in possessing bipinnate fronds.

It is not certain that the Monongahela specimens are identical with *T. lesquereuxiana*. No specimens of this species are known for comparison and the published figures are almost of no value. Consequently the name *T. lesquereuxiana* must be retained until the type can be found and redescribed.

The fragments are sufficient for diagnosis and may be referred without hesitation to *T. jejunata*.

Taeniopteris jejunata Grand' Eury

1877 Flore carb. du dép. de la Loire p. 121.
1885 Zeiller: Bull. Soc. Geol. Fr. 3. Ser. 13: 137 pl. 9 fig. 2.
1888 Zeiller: Fl. foss. Commentry vol. 1 p. 280 pl. 22 fig. 7-9.
1893 Potonie: Fl. d. Rotl. v. Thuringen p. 145 pl. 17 fig. 3.
1906 Zeiller: Fl. foss. Blanzy et Creusot p. 111 pl. 33 fig. 1, 2.

[9] Die Flora d. Rotl. v. Thuringen p. 145
[10] Kans. Univ. Quart. 1901. vol. 10. p. 5

There are few good figures of this species, therefore I have indicated those generally accessible. The two specimens from Pennsylvania are slightly larger than those from Europe:

A. length = 38 mm.; max. width = 18 mm.; min. width = 15 mm.

B. length = 29 mm.; max. width = 14 mm.; min. width = 10 mm.

Neither is complete so it is not known if the leaf-base was petiolate or decurrent. The mid-rib is slender, the secondary veins depart at an angle of 45 degrees and always fork twice near the departure from the mid-rib. The branches of the secondary veins frequently fork again near the entire margin. These characters are similar to those usually found in European specimens, but are in certain respects unlike those of *T. lesquereuxiana* which is much larger (10 cm.) and has a more slender mid-rib. In *T. lesquereuxiana* the branches of the nerves rarely fork near the margin.

Potonie[11] gives the distribution of *T. jejunata* as Floras VI to VIII or in other words, from the Upper Ottweiler (=Stephanian) to the Lower Rotliegende. The same range is given by Gothan[12] who states that it is essentially Permian although it appears in the Uppermost Carboniferous. Bertrand[13] lists *T. jejunata* among the characteristic plants of the Saint-Etienne flora (Stephanian) of France. No undoubted records of this or of any other Taeniopteris occur earlier than the Stephanian stage of the Carboniferous. Lesquereux[14,15] has described two Pottsville (=Westphalian) "Taeniopterids." The

[11] 1896 Die floristische Glied. d. deutsch. Carb. u. Perm. p. 31

[12] 1923 Karb. u. Perm. Pflanzen p. 76

[13] 1928 Cong. Strat. Carb. Heerlen. 1927. p. 97

[14] Coal Flora. vol. 1. p. 153. pl. 25. fig. 7

[15] Ibid. vol. 3. p. 743. pl. 94. fig. 8

first, *T. smithii* was transmitted to him without label, but it is supposed to have come from the Pottsville of Alabama. The other, *T. truncata* was found in the Pottsville ("sub-conglomerate") of Campbell's Ledge, Pittston, Pennsylvania. Lesquereux questioned the reference of this species to Taeniopteris. Both of these plants belong to Megalopteris a genus characteristic of the Pottsville.

David White[16] has also described a species, *Taeniopteris ? missouriensis*, which is from the Lowest Allegheny or Upper Pottsville. There is a superficial resemblance to *T. jejunata* but a close inspection shows that its affinities are with the Pottsville Alethopterids such as *A. maxima* Andrews and *A. macrophylla* Newberry. In the later paper White questioned the genus and remarked that "perhaps it belongs more properly in *Alethopteris*." It is within the range of possibility that such Alethopterids, Megalopterids and the early bipinnate Taeniopterids have much in common. White's plant should be designated *Alethopteris missouriensis*.

Alethopteris, so far as known possesses medullosan stems and is thus pteridospermic. The botanical relations of the Paleozoic Taeniopterids are most uncertain. The term "pteridophyll" is usually applied to fern-like foliage of unknown attachment. The weight of evidence seems to indicate that they are marattiaceous ferns, although Sterzel[17] observed *Taeniopteris abnormis* Gutbier from the Rotliegende of Chemnitz with a species of Medullosa. If this attachment can be substantiated, a portion of the Taeniopteris group is pteridospermic. Zeiller[18] was inclined to agree with Sterzel although he did not examine the material. Both I. C. White and Sellards are reputed

[16] Bull. Geol. Soc. Am. vol. 4. p. 119. pl. 1. 1893
U. S. Geological Surv. Mon. 37. p. 140. pl. 40. fig. 1-7. 1899
[17] Beitrage zur Kennt. d. Medulloseae p. 118. 1896
[18] Fl. foss. Blanzy p. 111. 1906

to have found fructifications on American Taeniopterids, but the evidence is inadequate. Certainly there is no basis for assuming that the Paleozoic members are cycadophytes in a restricted sense.

As a matter of permanent record it may be well to present a compilation of all the American occurrences and place them with their related species.

The most comprehensive account of Paleozoic Taeniopterids is that given by Professor T. G. Halle in his magnificent memoir on the Shansi flora.[19] In this work he describes eight species, six of which are new. Halle adopted a strict delimitation of species. Sellards[20] has given a full account of the Kansas Taeniopterids. More recently David White[21] and Elias[22] have added to our knowledge concerning their distribution in southwestern United States. White has also recorded a number of specimens from the Hermit Flora ("Upper Permian") of Grand Canyon, Arizona.[23] These are attributed to three species, one of which was new: *Taeniopteris* aff. *T. eckhardti* Kurtze, *T. angelica* D. White (p. 93) and *T. coriacea* Goeppert. The first of these does not belong to Kurtze's plant.

PALEOZOIC TAENIOPTERIDS

Taeniopteris jejunata *Grand' Eury*

1877 Flore Carb. Loire p. 121.

Common in Europe. Reported now from Pennsylvania.

[19] Paleont. Sinica, Ser. A. vol. 2, Fasc. 1, 1927

[20] Kans. Univ. Quart. 1901. vol. 10. pp. 1-12. figs. 1-4

[21] Proc. U. S. Nat. Mus. 1912. vol. 41. pp. 505-508

[22] XI Int. Geol. Congr. Abstracts 1933. pp. 69, 70

[23] Carn. Inst. Wash. Publ. 405. 1929. pp. 92-95

Related species:

Taeniopteris carnoti Renault & Zeiller

1888 Etudes terr. houill. Commentry vol. 1 p. 282 pl. 22 fig. 10.

Stephanian of France

Taeniopteris lescuriana Fontaine & White

1883 Perm. Flora p. 91, pl. 34. fig. 9, 9a.

Stephanian (Washington) of West Virginia

Taeniopteris plauensis Sterzel

This species probably belongs here.

Taeniopteris coriacea *Goeppert*

1864 Foss. Fl. Perm. Form. p. 130. pl. 8. fig. 4; pl. 9. fig. 2.

Common in Europe, also in Texas, Kansas and Oklahoma.

Related species:

Taeniopteris newberriana Fontaine & White

1883 Perm. Flora p. 91. pl. 34. figs. 1-8.

West Virginia and Kansas.

Taeniopteris tingii Halle

1927, in Pal. Sinica. v. 2. p. 158. pl. 42. figs. 1-8.

Permo-carboniferous of China.

Taeniopteris multinervis *Weiss*

1869 Foss. Fl. Jung. Steink. u. Rotl. p. 98. pl. 6. fig. 13.

Abundant in Europe, Asia and southwestern United States, it is not known from the Appalachian province.

Taeniopteris abnormis *Gutbier*

1835 Vers. Zwick. Schwarzkohl p. 73.

1849 Vers. d. Zeckst. u. Rothl. p. 17. pl. 7. figs. 1, 2.

Rather rare in Europe; occurs in Texas and Oklahoma.

Related species:

Taeniopteris shansiensis Halle
1927 in Pal. Sinica. v. 2. p. 153. pl. 40. figs. 1-4.

Taeniopteris nystroemii Halle
1927 in Pal. Sinica. v. 2. p. 148. pl. 39.

Taeniopteris latecostata Halle
1927 in Pal. Sinica. v. 2. p. 145. pl. 38. figs. 1-6.

Taeniopteris fallax *Goeppert*

1864 Foss. Fl. Perm. Form. p. 130. pl. 9. fig. 3.
Rare in Europe
Related species:

Taeniopteris densissima Halle
1927 in Pal. Sinica. v. 2. p. 156. pl. 41. figs. 5-7.

Halle considers "*Taeniopteris*" *smithii* Lesquereux to be a relative of *T. fallax*. It is really a Megalopteris.

Several other satisfactory species are known and these are cited for comparison. None of them are known to have close American affiliates.

Taeniopteris schenki Sterzel in Neues Jahrb. Min. 47 (1876) 382. pl. 5. fig. 6, 6a.

Taeniopteris Zeilleri P. Bertrand in Ann. Soc. geol. Nord, 39 (1910) 353. pl. 4. fig. 1-5.

Taeniopteris norini Halle in Pal. Sinica 2 (1927) 157. pl. 41. fig. 8, 9.

Taeniopteris serrulata Halle in Pal. Sinica 2 (1927) 160. pl. 42. fig. 13-18.

Taeniopteris (?) *serrata* Halle in Pal. Sinica 2 (1927) 161. pl. 42. fig. 1-12.

I have intentionally disregarded several records of Taeniopteris based upon fragmentary specimens which

have not received specific designation. All of these indeterminate fragments are from Kansas and Texas and probably belong to well-known species.

This genus obviously possessed an extensive geographic distribution during Stephanian and Permian times. Its value as an "index" genus has been recognized in Europe. Halle considered it to be significant in China, and Elias (l. c.) called attention to its position in the Kansas succession.

The plants associated with *Taeniopteris jejunata* in the Monongahela series of western Pennsylvania are:

Pecopteris arborescens
Pecopteris feminaeformis
Pecopteris unita
Pecopteris polymorpha
Pecopteris bredovi
Pecopteris daubreei
Callipteridium gigas
Diplotmema ribeyroni
(Mariopteris cordato-ovata
Lesqx., non Weiss)
Zeilleria sp. nov.
Sphenopteris minutisecta
Alethopteris grandini
Lescuropteris moorii
Taeniopteris jejunata
Neuropteris cordata
Neuropteris rogersi
Neuropteris grangeri
Neuropteris sp.
(aff. N. neuropteroides)
Odontopteris reichi
Odontopteris genuina
Odontopteris sp. nov.
Sigillaria brardi
Asterophyllites equisetiformis
Sphenophyllum oblongifolium
Sphenophyllum tenuifolium
Poacordaites sp.
Walchia sp (aff. W. piniformis)

This association appears in the Upper Conemaugh Series (Clarksburg member) and continues with slight modification to the top of the Washington Series. Lescuropteris is abundant in the lower portion of the sequence and Odontopteris is most abundant in the middle.

The affinities of this flora are with those of St. Etienne, Commentry, Gard, Blanzy and Creusot. These localities are "type" Stephanian, and the species cited belong to the middle and upper Stephanian.

Professor Paul Bertrand has generously given his opinions and advice on my specimens. He has verified the identifications of *Taeniopteris jejunata*, *Odontopteris genuina*, *Pecopteris daubreei* and *Odontopteris reichi*.

The plant recorded here as *Diplotmema ribeyroni* Zeiller[24] is a common form which attains its maximum of abundance in the Lower Monongahela. The American specimens have been erroneously identified with *Pseudopecopteris cordato-ovata* Weiss. Lesquereux based the reference of a number of specimens to the species defined by Weiss on material from Pottsville. Due to an error in the *Coal Flora* the locality was considered to be Wilkes Barre instead of Pottsville. In the earlier years of investigation Lesquereux did not distinguish between *Pseudopecopteris sillimannii* and *Pseudopecopteris cordato-ovata*. Consequently his tray labels read "Wilkes Barre and Pottsville." The original manuscript catalogue gives the locality of the specimen figured on plate 37, figure 4 of the *Coal Flora* as Salem Coal, Pottsville, Pennsylvania.

David White described *Mariopteris occidentalis*[25] from the McAlester Coal Field and in comparing the plant figured by Lesquereux, cited it as *Mariopteris cordato-ovata* Weiss, Lesqx. The two species are distinct, *Mariopteris occidentalis* White is of Cherokee (= Allegheny) age.

The true nature of these specimens was recognized by Zeiller who included *Pseudopecopteris cordato-ovata* Lesquereux, non Weiss, in the synonymy of *Diplotmema ribeyroni*. He cited figure 4, plate 37 of Lesquereux. This figure is rather poor. The basal heteromorphy of the pinnules, a character which at once distinguishes it

[24] Fl. foss. Autun et Epinac p. 37. pl. 9A. fig. 1. See also Fl. foss. Commentry p. 91. pl. 4. figs. 3-5.

[25] U. S. G. S. 19th. Ann. Rept. 1899. pp. 480-483.

from *Mariopteris cordato-ovata* Weiss,[26] is much more pronounced than is indicated by the figure. American investigators have disregarded Zeiller's citation because the location of Lesquereux's specimen was unknown. It has been found in the Lesquereux collection at the Botanical Museum of Harvard University (number 6331). It conforms in every particular with Zeiller's figures and descriptions. *Diplotmema ribeyroni* has been found at Pottsville, Port Carbon, Renmerdale, Monongahela and Waynesburg, all in Pennsylvania and at Providence, Rhode Island.

The late Pennsylvanian rocks contain many of such "Permian" indicators. Their presence carries far more significance than the typical Coal measures plants among which they are submerged.

The occurrence of Taeniopteris in the Appalachian province is a fortunate event because its precise distribution in the Pennsylvanian Series can be determined. Fontaine and White found two species in the Washington or Lower Dunkard. Now the Monongahela Group beneath is also known to contain *Taeniopteris jejunata*. Consequently it would be difficult to reconcile the opinion recently expressed by Jongmans and Gothan[27] that no equivalents of the European Stephanian occur in eastern North America. Both the Washington and Monongahela Groups are Stephanian and characterized by a few "Permian" types. Taeniopteris is one of the most constant and widespread of these types.

[26] Foss. Fl. p. 28. pl. 1. fig. 1.

[27] 1934 Jaarverslag over 1933 Geol. Bur. Nederl. pp. 17-44

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, OCTOBER 31, 1935 VOL. 3, NO. 10

STUDIES IN STELIS. V.

BY

OAKES AMES

TWO RARE SPECIES FROM MIDDLE AMERICA

AMONG THE MIDDLE AMERICAN representatives of the highly technical genus Stelis, there are two remarkable, closely related species which have proved to be extraordinarily rare. They constitute a rather distinct subsection of Lindley's Labiatae. The first one to be described was published by H. G. Reichenbach in 1870 under the name *Stelis glossula*. Although the bibliographical references given below would seem to indicate that this species has been frequently in cultivation, herbarium records disprove this. The only specimens of which I have any knowledge are the type described by Reichenbach and a plant recently collected by C. H. Lankester in Costa Rica. The second species to be described was collected in Panama by C. W. Powell and was published in 1923 under the name *Stelis inaequalis*. In March 1923, I found a single plant of this species in the Republic of Honduras near Tela on the Atlantic coast. No other collections are known to me. That this second species of the alliance should have been overlooked through all the years of collecting in the countries lying between Mexico and Colombia until 1923 and then should have come to light almost simultaneously in two widely separated localities

is simply another of the many perplexing coincidences of botanical exploration.

Notwithstanding the intensive collecting that has been done in Costa Rica, *Stelis glossula*, so far as my records indicate, escaped detection following its publication in 1870 until 1934, when it was rediscovered by Lankester. It is indeed noteworthy that both *Stelis glossula* and *S. inaequalis*, which constitute a distinct subsection of the Middle American stelids, should exhibit a high degree of localization in their distribution.

To account for the rarity of *Stelis glossula* and its recent rediscovery in Costa Rica, following years of intensive botanical collecting there, it is only necessary to consider the limited distribution of many orchids and the chances against rediscovery if the restricted areas in which they grow are not visited by collectors. It would seem reasonable to suppose that Lankester collected his specimens of *S. glossula* in or very near the type locality and the species may continue to be missing from collections until that locality is again explored or another locality where it grows is discovered. Always, however, in discussing the rarity of certain epiphytic orchids, it should be remembered that they usually establish themselves on the limbs of lofty trees in dense tropical forests, a peculiarity in their occurrence which limits the frequency with which they are detected and results in rarity being ascribed to them although in reality they may be common.

Stelis glossula and *S. inaequalis* differ fundamentally from the species which Lindley grouped together in his section Labiatae, in that the secondary stems are almost obsolete and the plants in their habit resemble species of Masdevallia. Typical species of the Labiatae have elongated stems with the secondary stems well developed and usually widely separated. Furthermore, the labellum in flowers of typical examples of the Labiatae differs mark-

edly from the form of lip characteristic of *S. glossula* and *S. inaequalis*. Until a revision of the genus Stelis is attempted, these two species may be regarded as constituting a distinct subsection of Lindley's Labiatae.

Stelis glossula *Reichenbach filius* in Gard. Chron. (1870) 1373—Polakowsky in Jahresber. Ver. Erdk. Dresden, Wissen. Theil 16 (1879) 89—Hemsley in Gard. Chron. n.s. 12 (1879) 108; 16 (1881) 136; in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1883) 203—Pittier in Anal. Mus. Nac. Costa Rica 1 (1887) 73—Nicholson Ill. Dict. Garden. 3 (1887) 494; ed. 2, 3 (n.d.) 494—Wright & Dewar, Johnson's Gard. Dict. new ed. (1894) 930—Veitch Hort. Veitchii (1906) 154—Pucci Enciel. Ortic. 4 [1916] 1436—Hubbard in L. H. Bailey Stand. Cycl. Hort. 6 (1917) 3234; new ed. 3 (1925) 3234—Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 445.

"Bilabiata, dense caespitosa; caulibus secundariis brevissimis; foliis cuneato oblongo-ligulatis apice minute bilobis cum denticulo; racemo longe distiche florido: bracteis triangulis ovaria longa non aequantibus; sepalo dorsali oblongo obtuse acuto quinquenervi elongato; sepalis lateralibus oblongo ovatis apiculatis apicem versus connatis subtrinerviis multo minoribus; petalis obtuse rhombeis uninerviis; labello carnoso papuliformi supradorsum bilamellato columna subaequali.

"A caespitose little Stelis, with spatulato-ligulate leaves, and a very curious inflorescence. The brownish flowers stand in two transverse rows, the upper sepal having a much longer extent than the whole of the other organs of the flower together.

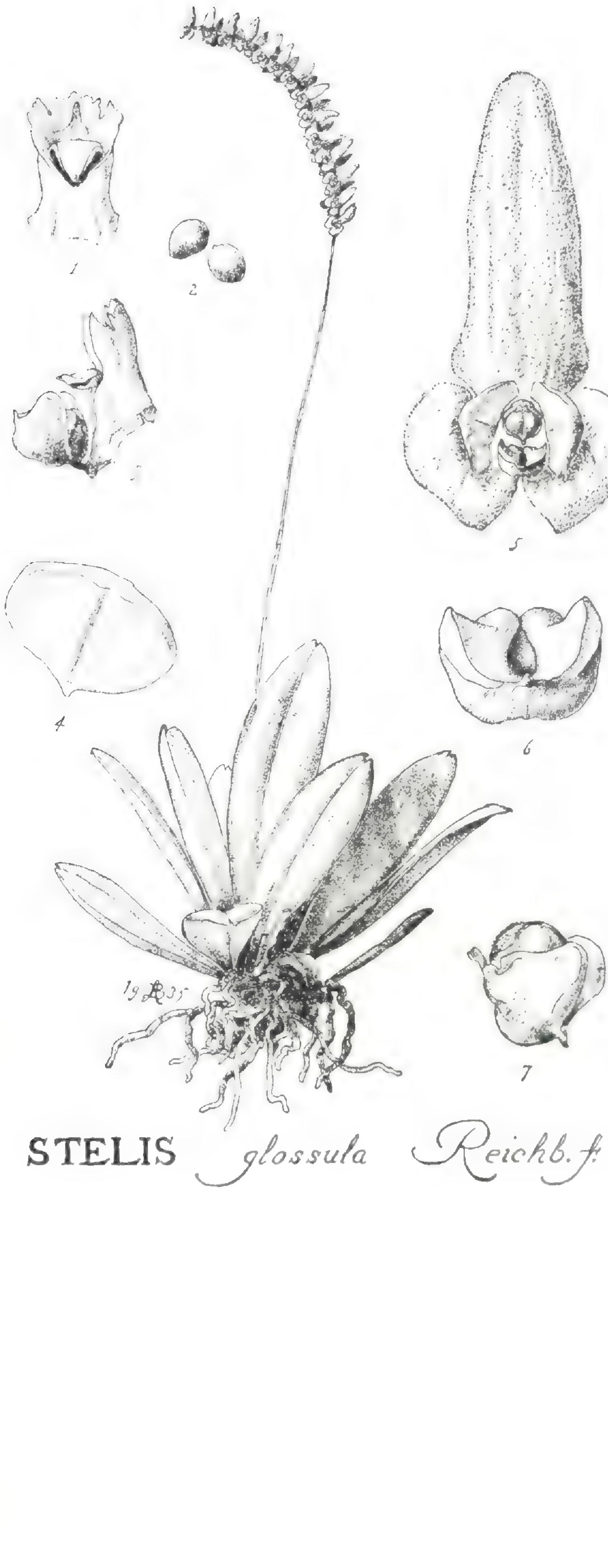
"This little species was imported by Messrs. Veitch from Costa Rica. *H. G. Rchb. fil.*" (*Reichenbach filius* in Gard. Chron. (1870) 1373).

The following redescription was prepared from the

EXPLANATION OF ILLUSTRATION

STELIS GLOSSULA *Reichb.f.* Plant natural size, drawn from *Lankester 1373*. 1, column (anther removed) enlarged eighteen times. 2, pollinia enlarged. 3, column and labellum, viewed laterally enlarged about eighteen times. 4, petal enlarged fifteen times. 5, flower enlarged about eleven times. In this figure the dorsal sepal was drawn as it appears in flowers preserved in alcohol, strongly convex with the margins reflexed. 6, labellum, front view enlarged about twenty times. 7, labellum, side view, drawn from Reichenbach's type of *Stelis glossula*. Plant and figures 1 to 6 drawn from a specimen collected by C. H. Lankester and preserved in alcohol.

Drawn July 1935 by BLANCHE AMES



STELIS *glossula* *Reichb. f.*

type and Lankester's no. 1373.

Roots fibrous, smooth, about 1 mm. in diameter. Secondary stems very short, almost obsolete, rarely exceeding 2 mm. in length, densely caespitose. Leaves 2–5 cm. long, 8–10 mm. wide, oblong-elliptic, about 3 mm. thick, bidentate at the tip with the mid-nerve extended into a short apicule. Peduncle with the raceme up to 9 cm. long; raceme up to 2.5 cm. long, arcuate. Pedicel and ovary about 1 mm. long, sheathed at the base of the pedicel by a short infundibuliform bract. Flowers numerous, distichous, about 4 mm. long. Lateral sepals 1.5–2 mm. long, 1–1.5 mm. wide, 3-nerved, connate to about the middle, forming a transversely elliptical convex lamina that is 2–3 mm. wide. Dorsal sepal 3–4 mm. long, 2 mm. wide, elliptical, obtuse, strongly convex, fleshy, 3–5-nerved, minutely glandulose on the inner surface. Petals about 1 mm. long, 1.5 mm. wide, flabellate or transversely elliptical, very fleshy, heavily 1-nerved through the middle. Labellum scarcely 1 mm. long, about as broad as long, 0.5 mm. thick, quadrate, strongly convex in front with an apiculate process at the rounded apex, posteriorly convex and densely papillose, shortly unguiculate at the base. Column 1 mm. long, 3-lobed at the summit, with the posterior lobe truncate or minutely denticulate; rostellum linguiform, triangular; stigmas confluent beneath the rostellum. Pollinia two.

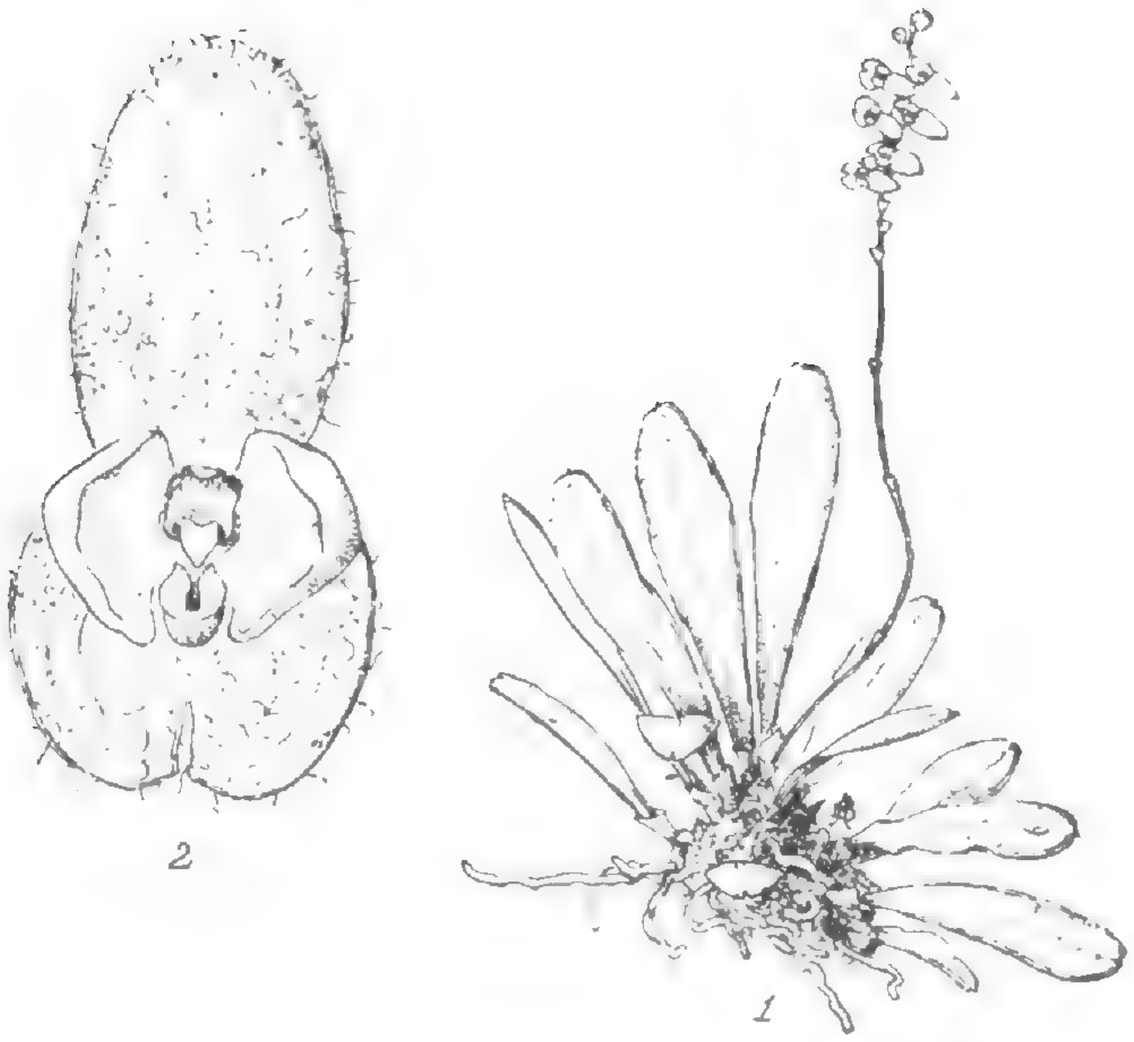
Costa Rica, without exact locality. *Endres* (Type in the Reichenbach Herbarium, being a plant from the horticultural establishment of James Veitch); Buenos Aires de Terraba. In scrubby forest on slender limbs of trees near a creek. Probably widespread, though only a few plants were seen. Lateral sepals, petals and lip brown. Dorsal sepal yellow or brown. Anther white. May 1934. (flowering in Cartago in August 1934), *C. H. Lankester 1373*.

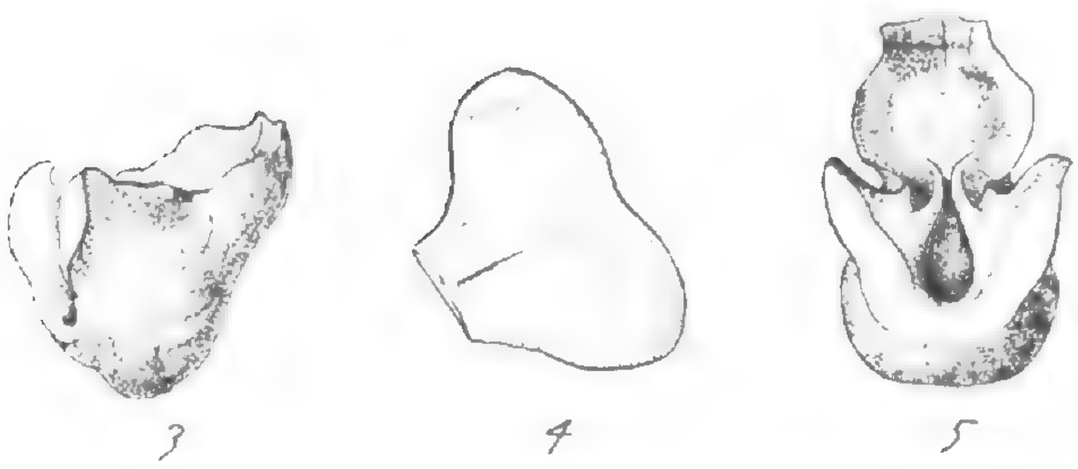
Stelis inaequalis *Ames* in Sched. Orch. 4 (1923) 12; in Standley Flora of the Panama Canal Zone in

EXPLANATION OF ILLUSTRATION

STELIS INAEQUALIS *Ames*. 1, plant drawn natural size from the type. 2, flower enlarged about twelve times, drawn from *Ames II. 243*. In this figure the dorsal sepal is drawn as it appears in dried flowers when flattened by pressure. Cf. fig. 5 under explanation of plate of *S. glossula*. 3, labellum, side view, enlarged about thirty-six times, drawn from *Ames II. 243*. 4, petal enlarged about twenty-four times, drawn from the type. 5, labellum enlarged about thirty-six times.

Drawn from dried specimens July 1935
by BLANCHE AMES





STELIS *inaequalis Ames*

Contrib. U. S. Nat. Herb. 27 (1928) 133.

Stelis inaequalis is most clearly differentiated from *S. glossula* by the smaller leaves which average 2 cm. in length, by the smaller flowers and by the inapiculate termination of the lip. Lateral sepals 1 mm. long. Dorsal sepal 2–2.5 mm. long. Lip 0.5 mm. long, very fleshy, lightly pandurate with a deep, rounded depression in front, shortly bicarinate below the middle. Column 3-lobed at the summit with the stigmas confluent beneath the triangular rostellar process. In the specimens from Panama and Honduras the leaves are from 1.5–3.2 cm. long and about 5 mm. wide. The peduncle and raceme together are approximately 5 cm. in length.

Honduras, Department of Atlántida near Tela. Epiphyte in open forest. March 21, 1923. *Ames II. 243.*

Panama, San Juan at sea-level in the foothills of the upper reaches of the Chagres River. Growing on the upper side of large limbs of trees. Flowers chocolate color, appearing in January and February. *C. W. Powell 272.*

STUDIES REGARDING THE SYNONYMY OF THREE SPECIES FROM MIDDLE AMERICA

Stelis ovatilabia *Schlechter* in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 446, *nomen*, and in Fedde Repert. 15 (1918) 211.

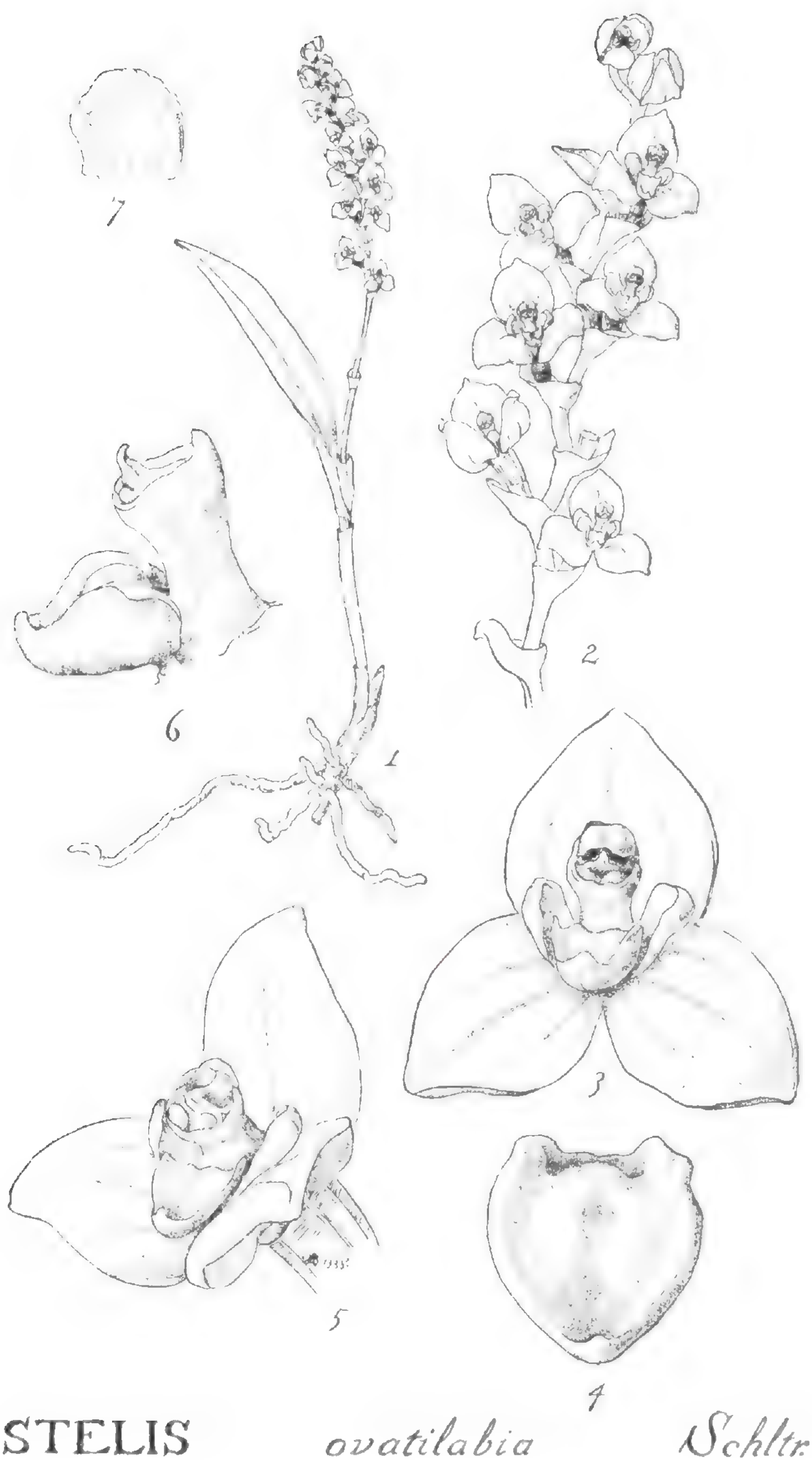
Stelis cyclopetala Schlechter in Fedde Repert. Beihefte 19 (1923) 279.

In 1918, Rudolf Schlechter described *Stelis ovatilabia*, a new species from Guatemala. The type specimen consists of a single plant collected in 1878 by Bernoulli and Cario. This species is exceptional among Middle American representatives of the genus in the relative lengths of the column and petals. The column is diagnostic in that it is almost twice longer than the petals.

EXPLANATION OF ILLUSTRATION

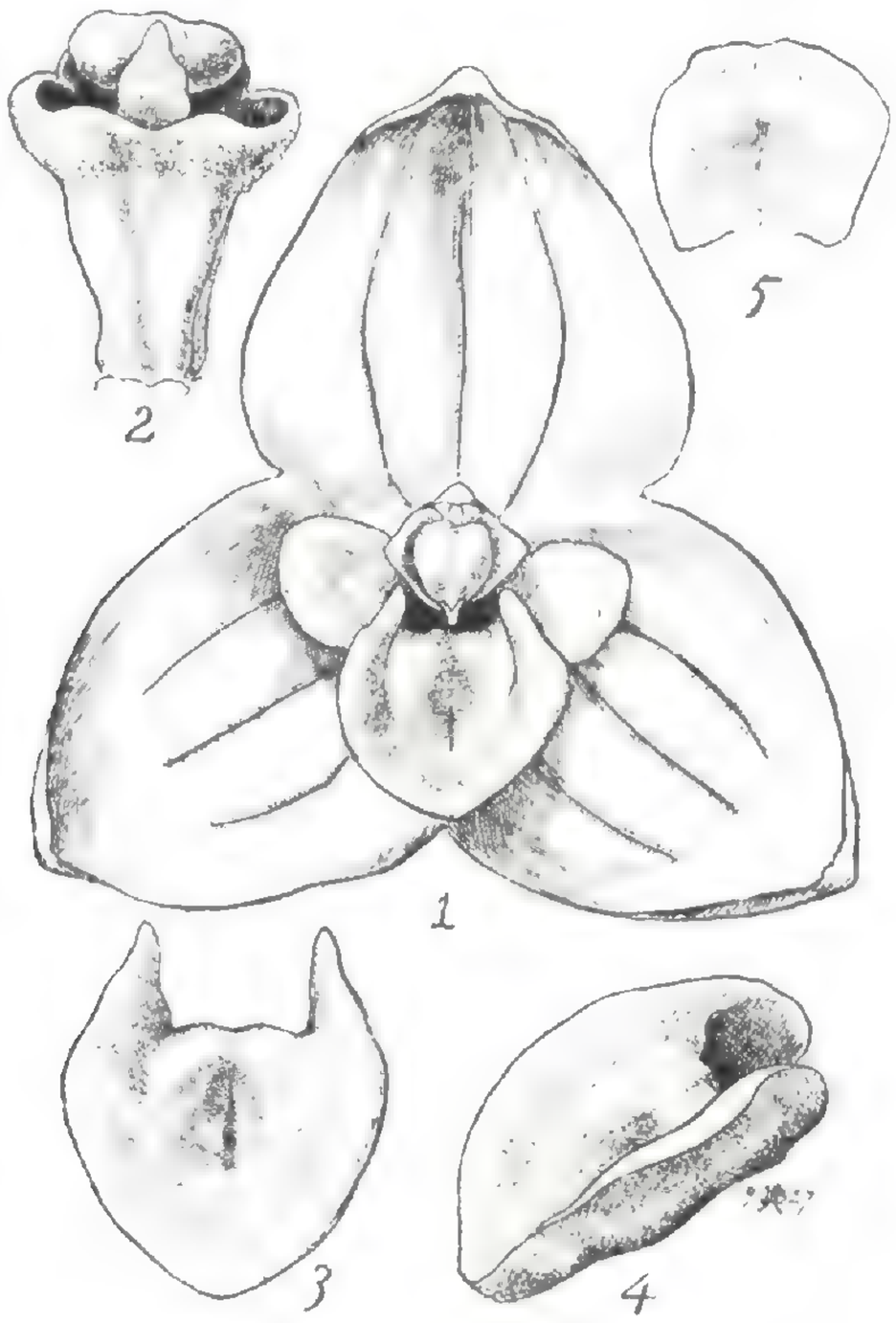
STELIS OVATILABIA *Schltr.* 1, plant natural size drawn from *Bates 19.* 2, raceme much enlarged. 3, flower enlarged eleven times. 4, labellum enlarged twenty-two times. 5, flower enlarged eleven times. 6, column (anther removed) enlarged twenty-one times. 7, petal enlarged twenty-one times.

Drawn July 1935 from specimens preserved in alcohol
by BLANCHE AMES



STELIS *ovatilabia* *Schltr.*

Stelis ovatilabia is a variable species in the length of the secondary stems and in the length of the leaves. The type is about 11 cm. tall from the base of the secondary stems to the tip of the raceme, with the leaves 3.5–5 cm. long and 6–8 mm. wide; but specimens measuring only 6 cm. in height have been seen, and several plants collected recently in Guatemala by Alexander F. Skutch exceed 22 cm. in height. In all of the specimens examined the flowers are about of equal size, the sepals measuring 2 mm. in length. The stigmas are confluent beneath the rostellar process of the column and when fresh protrude as semiglobular masses of viscous consistency.



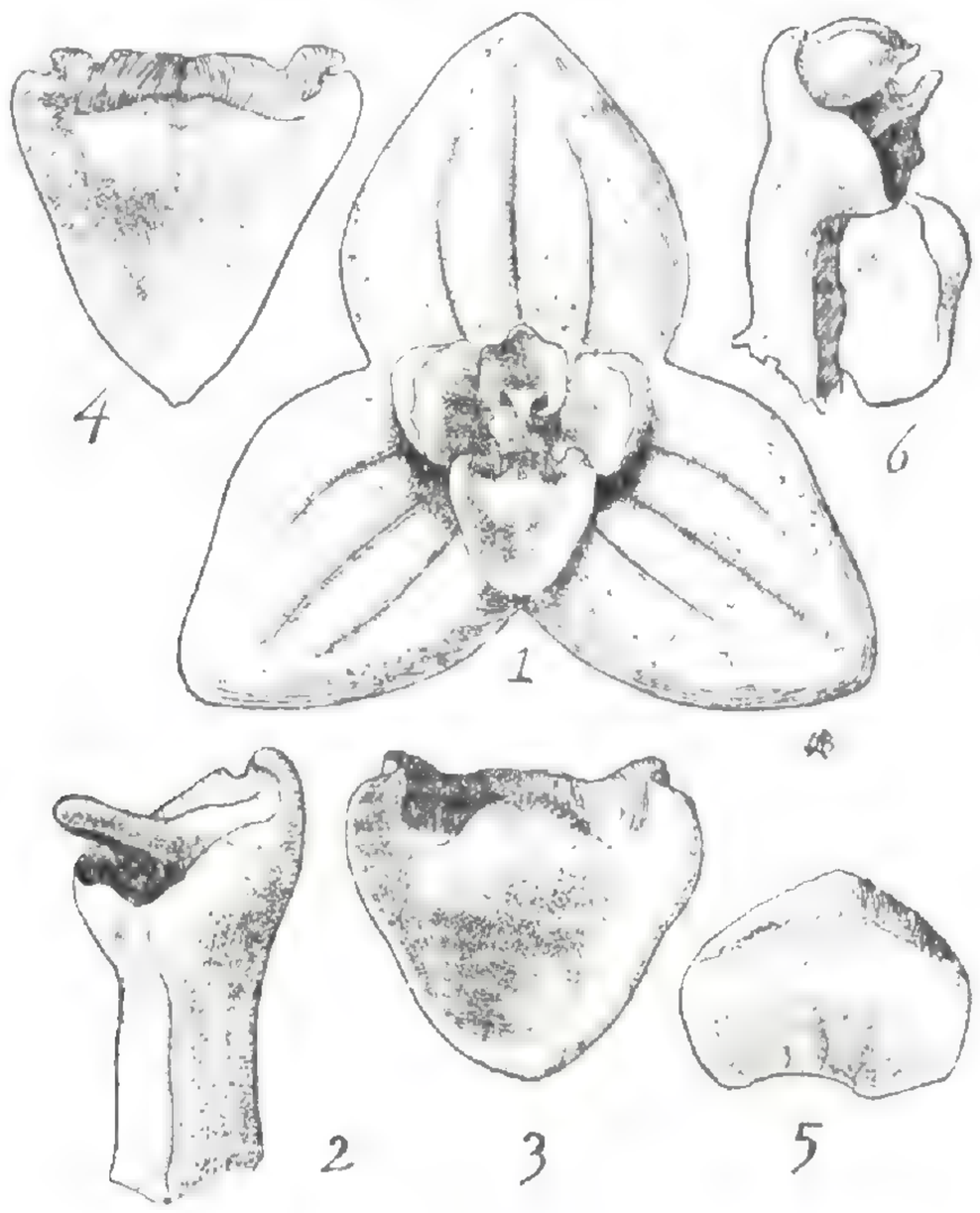
Stelis ovatilabia Schltr. drawn from the type of *S. cyclopetala* Schltr. 1, flower enlarged about thirteen times. 2, column, front-view, enlarged twenty times. 3, labellum enlarged twenty times. 4, labellum enlarged about twenty times. 5, petal enlarged twenty-two times.

Drawn with the aid of the camera lucida from a dried specimen by Blanche Ames

In dried specimens the fleshy labellum becomes flattened and more or less rounded at the tip (cf. text figure). In its natural condition the labellum is strongly concave, with the lip more or less acute and sharply bent upward, resembling *Stelis rubens* Schltr.

In 1923, Schlechter described a Costa Rican species naming it *Stelis cyclopetala.* In his observations regarding the distinctive character of the flower, he emphasized the strikingly tall column as being twice longer than the petals. As close allies of his new species he referred to *S. pusilla* HBK., and *S. angustifolia* HBK. Yet he made no mention of *S. ovatilabia* Schltr. which stands out distinctly among Middle American species of the genus in having an extraordinarily elongated column. *S. cyclopetala* is so similar to *S. ovatilabia*, differing from it chiefly in having more membranaceous petals, that there is every reason to suspect that Schlechter simply overlooked his earlier species when he proposed a new one. Perhaps the difference between the petals might be used to differentiate the Costa Rican *S. cyclopetala* as a variety of *S. ovatilabia*, yet this would seem to be unwise in view of our present knowledge of the peculiarities of Stelis. The type of *S. cyclopetala* is a diminutive plant scarcely 6 cm. tall, but the tendency toward great variation in the vegetative proportions of species of Stelis indicates the need for caution in using size of stems and leaves as specific characters. Schlechter made sketches of the labellum to show his conception of its structure and these sketches conform to my camera lucida drawings made from the types. In the illustrations prepared for this paper by Blanche Ames, the labellum of *S. cyclopetala* appears to be conspicuously auriculate while the labellum of *S. ovatilabia* is exauriculate. This difference, however, is apparent rather than real, because a slight compression of the labellum at the base in herbarium specimens of *S. ovatilabia*

induces an auriculate aspect. Furthermore, much depends on the angle at which the labellum is held when it is observed. If descriptions and drawings are made from dried specimens, allowances have to be made for changes ensuing after the flowers are crushed or flattened by pressure. Fortunately a specimen of *S. ovatilabia* collected by Marston Bates in Guatemala and preserved in alcohol has made it possible to represent the species with an approach to its aspect when alive.



Stelis ovatilabia Schltr. drawn in part from the type and from *Shannon 3670*. 1, flower enlarged about eleven times. 2, column (anther removed) enlarged about twenty-one times. 3, labellum enlarged twenty times. 4, labellum from the type enlarged about twenty times. 5, petal enlarged twenty-four times. 6, column and petal enlarged about eighteen times.

Drawn with the aid of the camera lucida from a dried specimen
by BLANCHE AMES

GUATEMALA, April 1878. *Bernoulli & Cario 583*: Department of Chimaltenango, Tecpam at 8,500 feet altitude. In mixed pine and oak forest. May 17, 1931. *Marston Bates 19*; Chichavac. At 8,000-9,000 feet altitude. Flowers greenish white. In pine and oak woods. July

9, 1933. *Alexander F. Skutch 374*: Department of Amatitlan. Volcán Pacaya. At 8,000 feet altitude. July 1892. *W.C.Shannon 3670.*

Costa Rica, El Copey, at 7,500 feet altitude. *H. Pittier*: On fallen oak. April 19, 1928. *H. E. Stork 1609.*

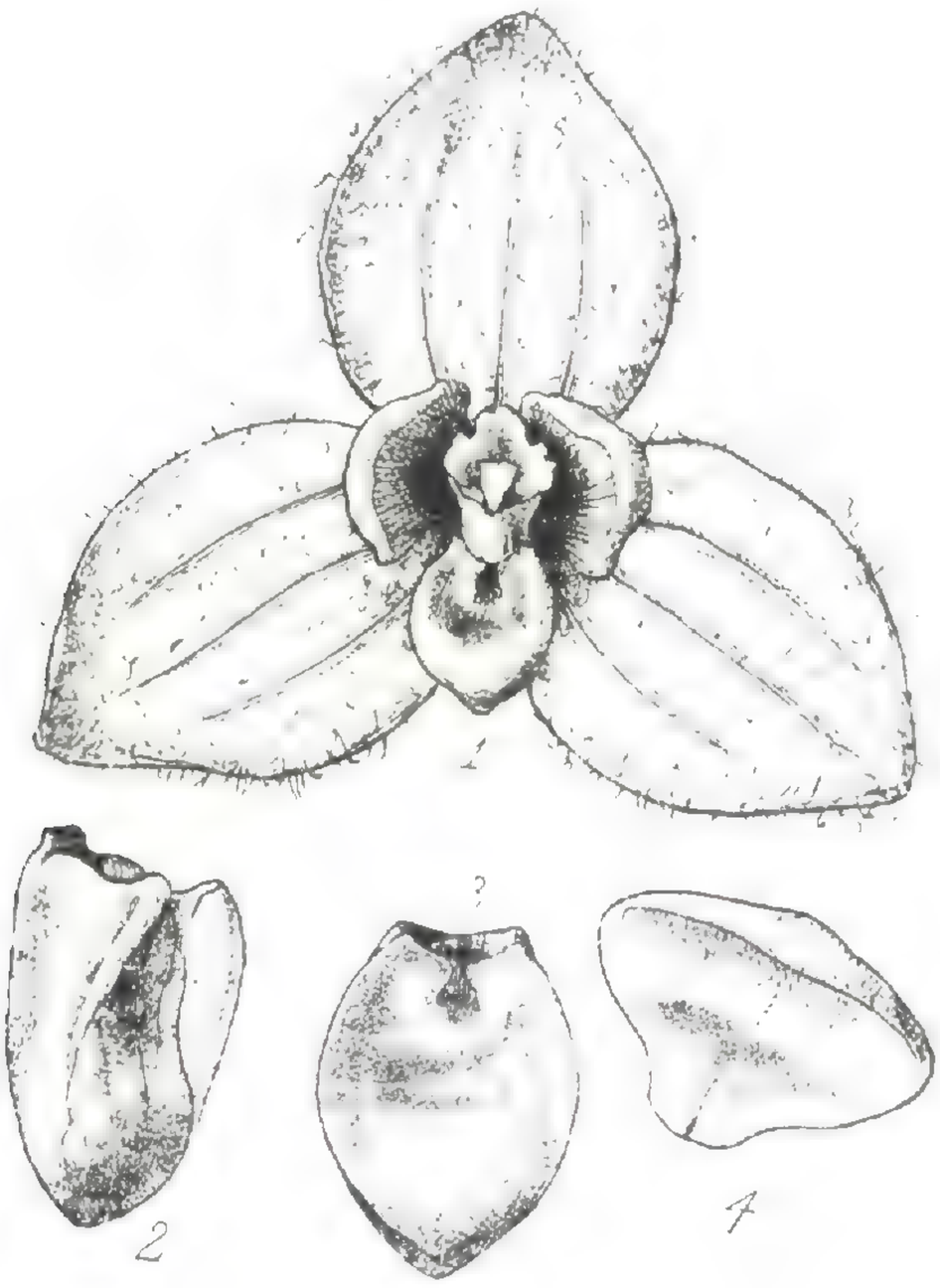
Stelis ciliaris *Lindley* in Comp. Bot. Mag. 2 (1836) 353—Loddiges Orch. [1842] 4—Reichenbach fil-

Stelis ciliaris Lindl. drawn from the type. 1, flower enlarged about nine times. 2 and 3, labellum enlarged about sixteen times. 4, column (anther removed) much enlarged. 5, petal enlarged about twenty-two times.

Drawn with the aid of the camera lucida from a dried specimen by Blanche Ames

ius in Linnaea 18 (1844) 400—Lindley Fol. Orch. Stelis (1858) p. 14—Paxton Bot. Dict. new ed. (1868) 537 Hemsley in Gard. Chron. n. s. 12 (1879) 108: 16 (1881) 136; in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1883) 203—Nicholson Ill. Dict. Garden. 3 (1887) 494: ed. 2, 3 (n.d.) 494—Wright & Dewar, Johnson's Gard. Dict.

new ed. (1894) 930—Wright, Cassell's Dict. Pract. Gard. 2 [1902] 360—Costantin Atlas Orch. Cult. [1913?] t. 22, figs. 17 & 17′. Pucci Enciel. Ortic. 4 [1916] 1436—Hubbard in L. H. Bailey Stand. Cycl. Hort. 6 (1917) 3234; new ed. 3 (1925) 3234—Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 444.



Stelis ciliaris Lindl. drawn from *Standley 23900*. 1, flower enlarged about nine times. 2 and 3, labellum enlarged about fifteen times. 4, petal enlarged about seventeen times.

Drawn with the aid of the camera lucida from a dried specimen by Blanche Ames

Stelis atropurpurea Hooker in Bot. Mag. 69 (1842) t. 3975—Lindley in Bot. Reg. 28 (1842) Misc. p. 86—Paxton Mag. Bot. 9 (1842) 239—D. Dietrich Syn. Pl. 5 (1852) 30—Paxton Bot. Dict. new ed. (1868) 537—Nicholson Ill. Dict. Garden. 3 (1887) 494; ed. 2, 3 (n.d.) 494—Wright & Dewar, Johnson's Gard. Dict. new ed. (1894) 930—Schlechter Orchideen (1914) 175; ed. 2, (1927) 172—Pucci

EXPLANATION OF ILLUSTRATION

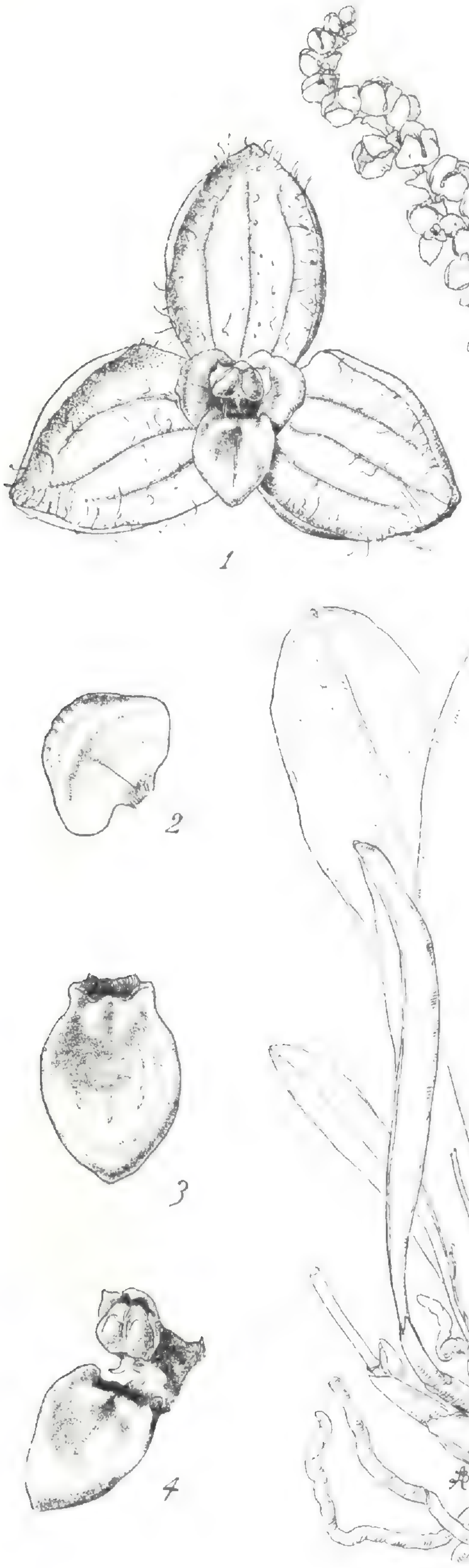
STELIS CILIARIS *Lindl.* Plant drawn natural size from the type of *Stelis Jimenezii* Schltr. 1, flower enlarged about nine times. 2, petal enlarged about thirteen times. 3, labellum enlarged about sixteen times. 4, column and labellum enlarged.

Drawn from dried specimens of Jimenez 621 with the aid of the camera lucida by BLANCHE AMES

STELIS

ciliaris

Lindl.



Enciel. Ortic. 4 [1916] 1435.

Stelis confusa Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 386, 444.

Stelis Jimenezii Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 389, 445; in Fedde Repert. Beihefte 19 (1923) 279.

In my opinion, *Stelis confusa* and *S. Jimenezii* are referable to *S. ciliaris*. The flowers of *S. Jimenezii* are larger as a rule (labellum about 2 mm. long) than the flowers of the type of *S. ciliaris*, in which the labellum is approximately 1.5 mm. long, but structurally they reveal nothing substantial by which to emphasize specific differentiation. In earlier studies of *S. Jimenezii*, I was inclined to regard it as being separable from *S. ciliaris* through vegetative differences, but recent studies have shown that these differences are negligible and nothing more than constitutional variation.

The sepals show varying degrees of glandulousness and ciliation. Schlechter described *S. Jimenezii* as being smooth-flowered, but the flowers of the type when closely examined proved to have both short and long glands on the surface, with the remains of broken marginal glands.

Mexico, State of Vera Cruz, Mirador. February 1839. *J. Linden 213*; Zacuapan. March 1913. *C. A. Purpus 2122* (Type of *S. confusa*): State of Campeche, Tuxpeña. February 14, 1932. *C. L. Lundell 1332.*

British Honduras, Maskall. Pine ridge. January 1934. *Percy H. Gentle 1100*: March 31, 1934. *Gentle 1196.*

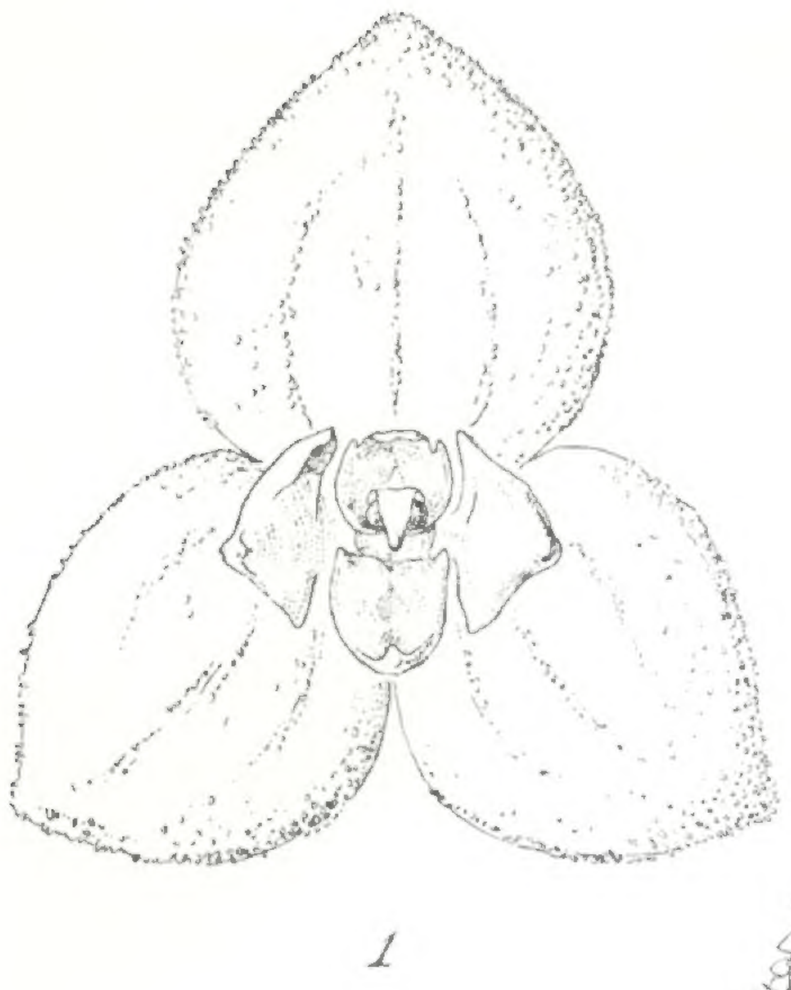
Guatemala, *Sereno Watson.* (Specimen cultivated in the Botanic Garden of Harvard University): District of Petén, La Libertad, Sabana Francisco. March 29, 1933. *C. L. Lundell 2141*; Department of Izabal, vicinity of Quirigua. At 75-225 meters altitude. May 15-31, 1922. *Paul C. Standley 23900.*

Costa Rica, Province of San José, La Verbena. February 1912. *Otón Jimenez 621* (Type of *S. Jimenezii*); Vicinity of La Verbena. At 1,200 meters altitude. January 29, 1924. *Paul C. Standley 32245*: San Ramón. *G. Acosta.*

EXPLANATION OF ILLUSTRATION

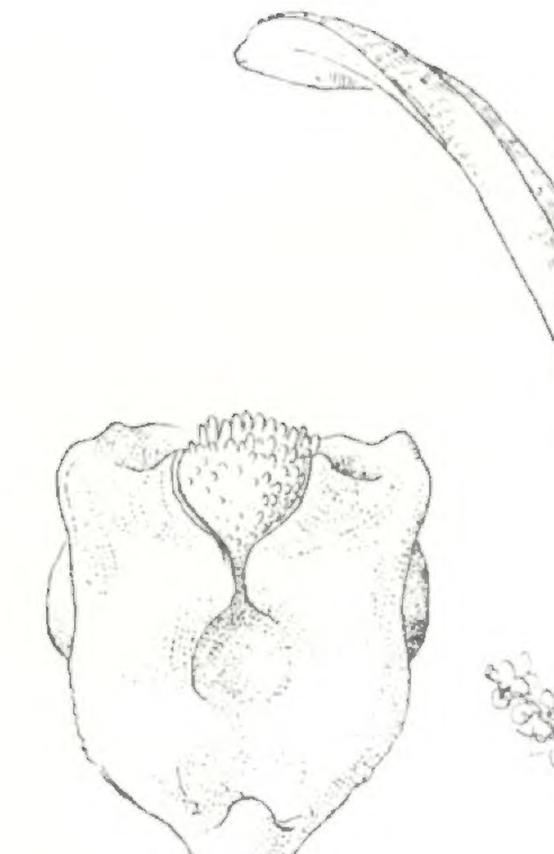
STELIS CRESCENTICOLA *Schltr.* Plant natural size, drawn from a duplicate type of *S. praemorsa* Schltr. 1, flower enlarged about twenty times. 2, labellum enlarged about thirty-two times. (The circular area which appears to be a hole is made up of the paler tissues of the basal callus which becomes abruptly narrowed at its distal end and fills the space between the convergent lobes of the disc). 3, labellum and column viewed from the side, enlarged about thirty-two times. 4, column (anther removed) enlarged about thirty-two times. 5, petal enlarged about thirty-eight times. 6, part of the raceme, much enlarged.

Drawn with the aid of the camera lucida from specimens (preserved in alcohol) of Powell 234 by BLANCHE AMES

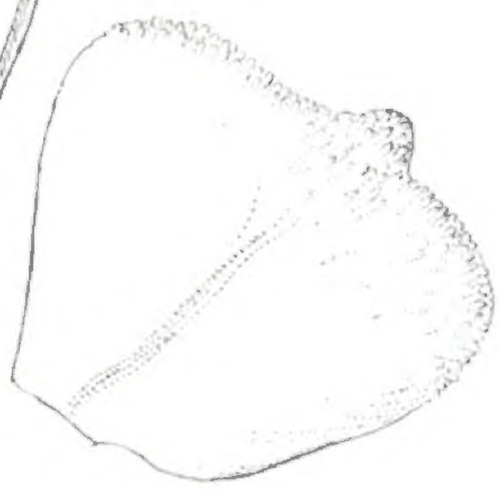


1

2

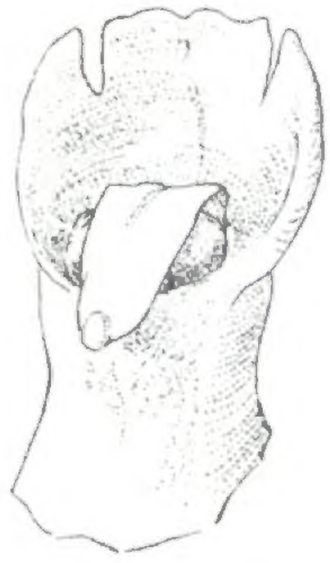


3



5

6



4

STELIS *crescentiicola* *Schltr.*

Stelis crescentiicola *Schlechter* in Fedde Repert. 16 (1920) 442—Ames in Sched. Orch. 5 (1923) 11.

Stelis flexuosa Lindley sensu Kränzlin in Engler Bot. Jahrb. 26 (1899) 450.

Stelis Isthmi Schlechter in Fedde Repert. Beihefte 17 (1922) 16.

Stelis praemorsa Schlechter in Fedde Repert. Beihefte 17 (1922) 17.

In Schedulae Orchidianae, I discussed the characters of *Stelis crescentiicola* Schltr. and gave my reasons for reducing *S. Isthmi* Schltr. and *S. praemorsa* Schltr. to synonymy. When my remarks regarding *S. Isthmi* and *S. praemorsa* were written, I had arrived at my conclusions from a study of duplicate specimens taken from the plants in C. W. Powell's Balboan garden that had supplied Dr. Schlechter with his types. Since then I have examined the type specimens preserved in Schlechter's herbarium and have been able to justify my suspicion that Schlechter described the labellum of *S. praemorsa* from imperfect flowers and to support my conclusion that *S. Isthmi* is inseparable from *S. crescentiicola*.

Stelis crescentiicola is most closely allied to *S. latipetala* Ames (cf. Bot. Mus. Leafl. Harv. Univ. 3 (1935) 53), but differs from it in the consistently smaller leaves, in the lobes of the column and in the form of the labellum. The flowers vary in color from white to purple with pink-flowered and pink- and yellow-flowered forms occurring. The labellum is scarcely 1 mm. long, very fleshy and characterized by a more or less abruptly ascending, rounded tip. Viewed from the side it is triangular. In dried specimens the labellum exhibits a wide range of variation caused by the changes brought about by the shrivelling of its fleshy tissues. The column has the stigmas confluent beneath the triangular rostellar process.

Costa Rica, Pandora. *A. Alfaro 205*: Salvaje, 1925. *Alfaro 204*.

Panama, *F. C. Lehmann 4540* (Type of *Stelis crescentiicola* Schltr.): east of Panama City, *C. W. Powell 234* (Type of *Stelis praemorsa* Schltr.): near Arrajan west of the Canal about at sea-level: east of Panama City, *C. W. Powell 232* (Type of *Stelis Isthmi* Schltr.): foothills east of Panama City. Flowers white. *Powell 285*; flowers pink, *Powell 284*: San Juan. Epiphyte at sea-level, April 1923. *Powell 3312*: San Juan range. Epiphyte at sea-level. March 1924. *Powell 3522*: epiphyte on large bignoniaceous vine in tidal belt. Flowers greenish. April 24, 1914. *H. Pittier 6595*.